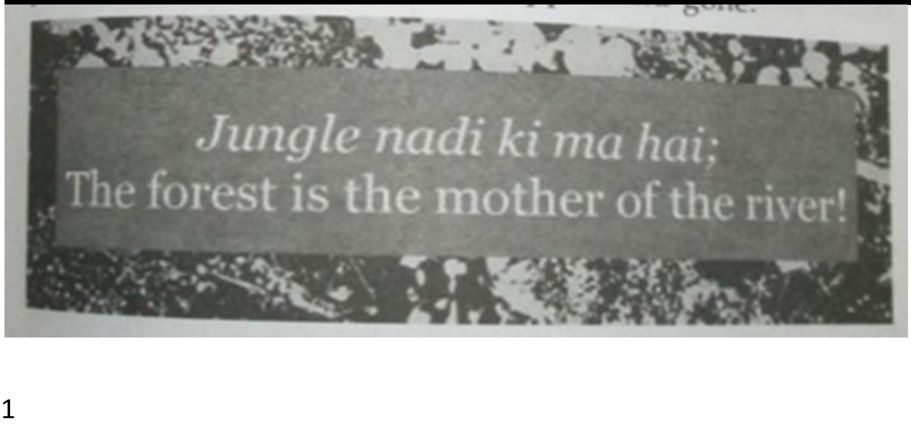
Holistic Design of Lake Ecosystems for Water Security



Jungle nadi ki ma hai;
The forest is the mother of the river!

Contents –

Page

Important Features of a Healthy Lake …… … …… ……….. ……… ……….. ………. ………. .. … 4

Sacred Jungles BioDiversity & Spongy Soil's Great Water Retention Capacity …… … .. 5

The Importance of Pure Natural Water to All Life …………….. ……… …………… ………… ….. 7

Doddagubbi , Bangalore – Successful Lake-Portion Revival – Water to 4 Villages … … 8

Narayana Gurukula, Bangalore – Successful Mini Lake Creation – Perennial Water….. 9

Wetland GroundWater Recharge & Termite Nests Harvest & Biodiversity Charts.. …. 12

Stand Alone Islands – Self-Sustained Eco-Systems ……. ………….. ……………. ………. …….. 15

Natural Lake & Drain Edging ……… …………… ………… …………….. …………. ………. ……… … 16

Low Organic Ceck-Dam Retention Walling ………… ………… ……….. …………. ………… …… 17

Design Principles for Urban Lake Designing ……………. ……….. ……………. ………… ……….. 20

Foreign Project Models ………… ……………….. ….. ………. ………… …………… ………… ……… 22

Indian Lake Legends ………….. ……………. …………….. ………………. …………. …………… ……… 29

9 Seasons on Our Local Healthy Native Lake Environment ……….. ….. ….. … ……. ……… 41

Doddagubbi Lake, Bangalore - Project Report ……….. ………….. ……………… ………… ……… 43

Doddagubbi Flora …………. …………….. ……………. ……………. ……………… ………… …………. 61

Doddagubbi Fauna …………. ……………. ………………. ……………. …………….. ……………. ……. 66

Comparative of Doddagubbi Lake Water and Other Lake Waters ………… ………. ……….. 74

Bangalore District Commissioner's Letter of Support to Protect Our Project … …. ……. 75

Benefits to Locals …………… ……………… ………………. ………………. ……………… ………… ……. 76

Public Lake Awareness Poster ……….. …………… ……………. ……………. …………. …………… 80

World Famous Authors' & Scientists/Experts Support For Our Project … … …………. …. 81

Best Reference Books & Quotes of Various Peoples on Value for Environment … ….. ..86

Creative Design Features & Art Works Examples ……………………… ………….. …….. 96

Conclusion ___ ___ __ ____ ___ _ _ ____ ____ ________ ________ _____ __ 101

++ < 20 Possible to Save Oases Left in Bangalore.. .. ……. ……….. …………. ……… …….. … 103

+ Further Interesting Related Projects …….. ……….. ………. ………… ……….. ………. …….. ….105

+ Relevant Scientific Research Data …. ….. ….. …….. …… …….. ………. ………. ……… . .. … 113

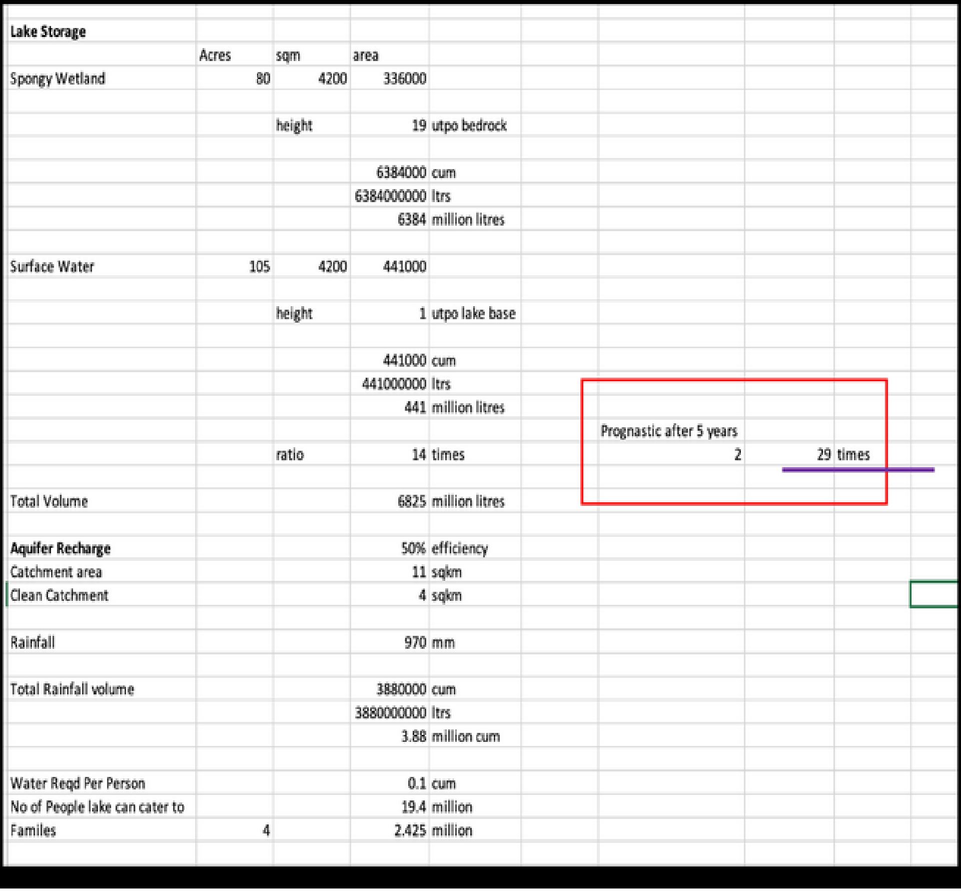
+ Climate Risk Statistics, Maps _____ _ _______ _______ ______ ______ _____ 124

Important features of a healthy lake

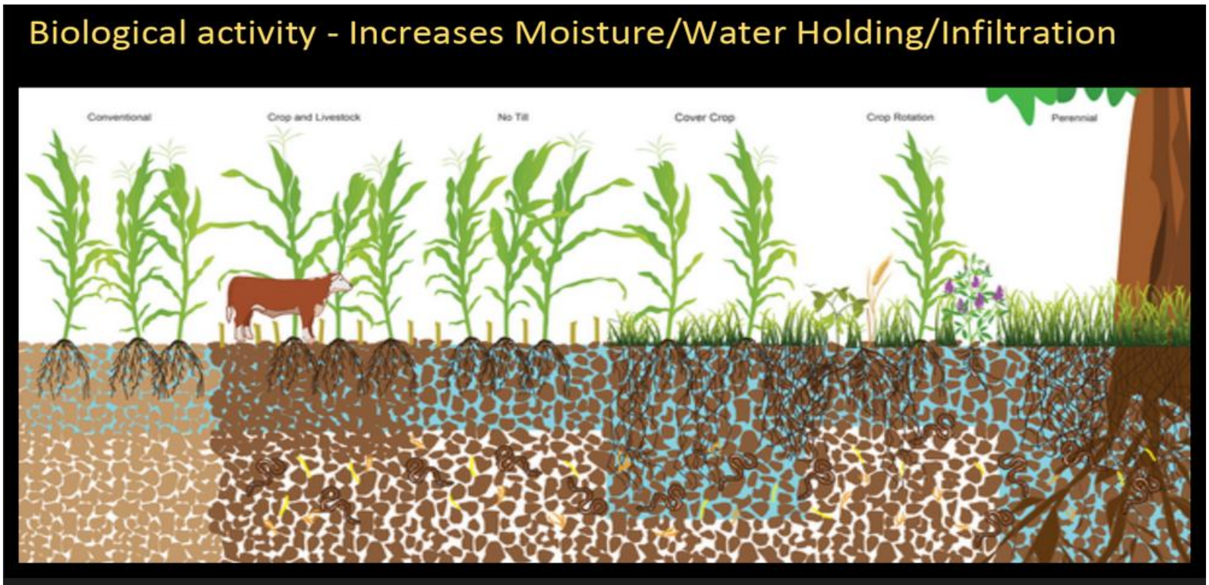
- Moisture Retention of Natural Spongy Soil
- Sacred Jungle Biodiversity
- Shallow Pond Biodiversity
- Island Ecosystem Stability

- Undisturbed Sacred jungles are rich in bio diversity
- 100 to 1000 times more bio diversity than reserved forest

Soil water holding Volume - 30 times more in soil than lake in 5 years

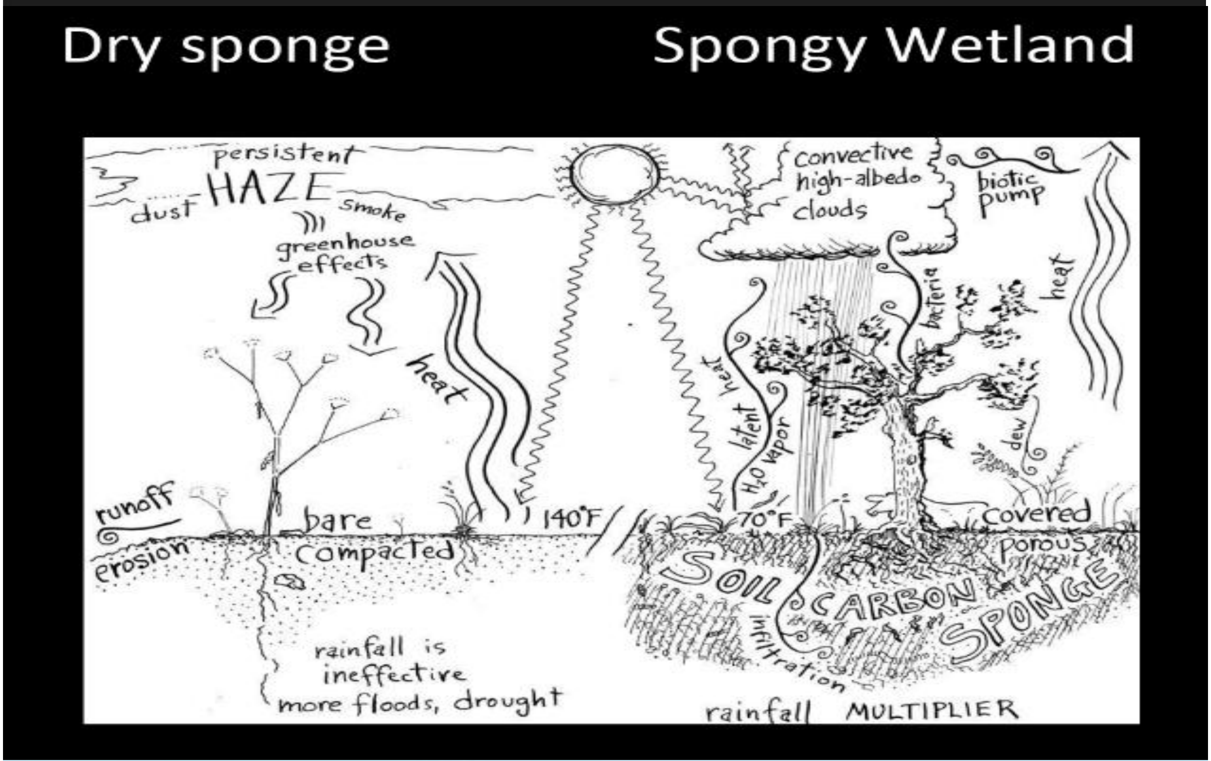


Lake Storage								
	Acres	sqm	area					
Spongy Wetland	80	4200	336000					
		height	19	utpo bedrock				
			6384000	cum				
			6384000000	ltrs				
			6384	million litres				
Surface Water	105	4200	441000					
		height	1	utpo lake base				
			441000	cum				
			441000000	ltrs				
			441	million litres				
						Prognastic after 5 years		
		ratio	14	times		2	29	times
Total Volume			6825	million litres				
Aquifer Recharge			50%	efficiency				
Catchment area			11	sqkm				
Clean Catchment			4	sqkm				
Rainfall			970	mm				
Total Rainfall volume			3880000	cum				
			3880000000	ltrs				
			3.88	million cum				
Water Reqd Per Person			0.1	cum				
No of People lake can cater to			19.4	million				
Familes	4		2.425	million				



Biological activity - Increases Moisture/Water Holding/Infiltration

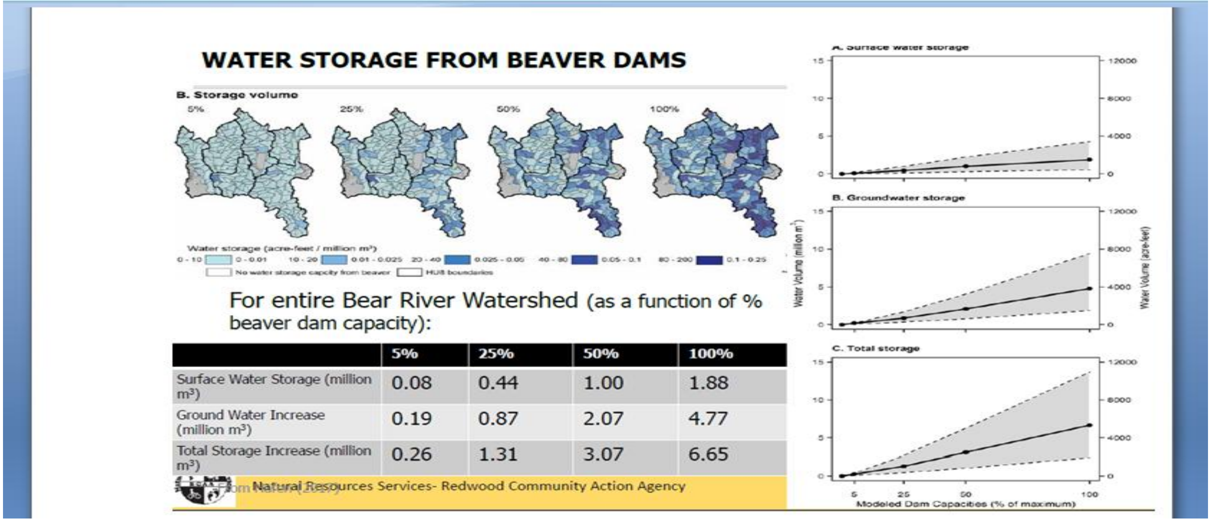
Conventional
Crop and Livestock
No Till
Cover Crop
Crop Rotation
Perennial



Dry sponge

Spongy Wetland

persistent
HAZE
dust
smoke
greenhouse effects
heat
runoff
erosion
bare
compacted
rainfall is ineffective
more floods, drought
140°F
70°F
convective high-albedo clouds
biotic pump
bacteria
heat
latent heat
H2O vapor
dew
covered
porous
SOIL CARBON SPONGE
infiltration
rainfall MULTIPLIER

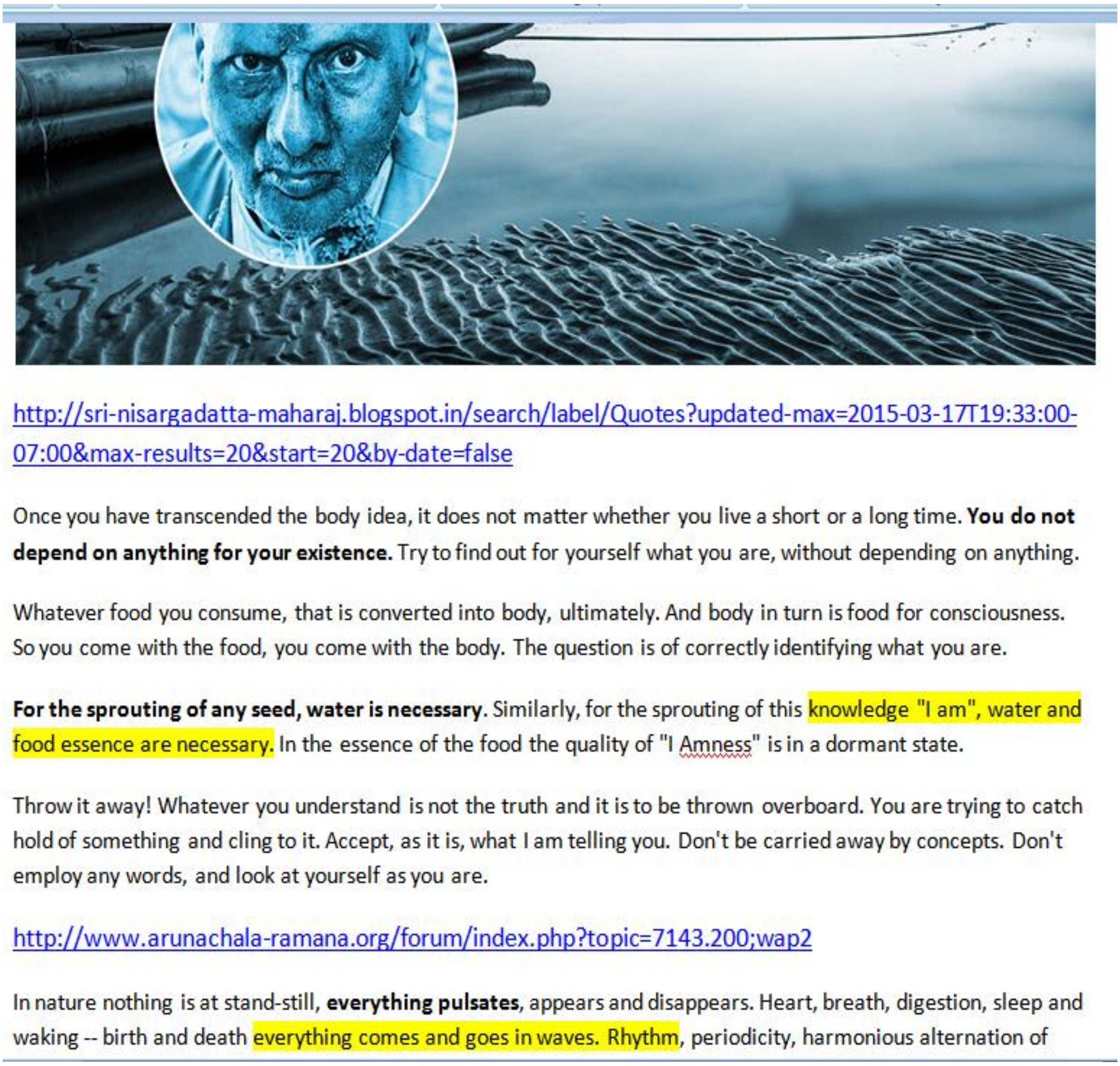


WATER STORAGE FROM BEAVER DAMS

For entire Bear River Watershed (as a function of % beaver dam capacity):

	5%	25%	50%	100%
Surface Water Storage (million m³)	0.08	0.44	1.00	1.88
Ground Water Increase (million m³)	0.19	0.87	2.07	4.77
Total Storage Increase (million m³)	0.26	1.31	3.07	6.65

Natural Resources Services- Redwood Community Action Agency



http://sri-nisargadatta-maharaj.blogspot.in/search/label/Quotes?updated-max=2015-03-17T19:33:00-07:00&max-results=20&start=20&by-date=false

Once you have transcended the body idea, it does not matter whether you live a short or a long time. **You do not depend on anything for your existence.** Try to find out for yourself what you are, without depending on anything.

Whatever food you consume, that is converted into body, ultimately. And body in turn is food for consciousness. So you come with the food, you come with the body. The question is of correctly identifying what you are.

For the sprouting of any seed, water is necessary. Similarly, for the sprouting of this knowledge "I am", water and food essence are necessary. In the essence of the food the quality of "I Amness" is in a dormant state.

Throw it away! Whatever you understand is not the truth and it is to be thrown overboard. You are trying to catch hold of something and cling to it. Accept, as it is, what I am telling you. Don't be carried away by concepts. Don't employ any words, and look at yourself as you are.

http://www.arunachala-ramana.org/forum/index.php?topic=7143.200;wap2

In nature nothing is at stand-still, **everything pulsates**, appears and disappears. Heart, breath, digestion, sleep and waking -- birth and death everything comes and goes in waves. Rhythm, periodicity, harmonious alternation of

March 22

World Water Day

which focuses on the sustainability & importance of freshwater

Doddagubbi Lake Part – Successful ground water rejuvenation for 4 villages

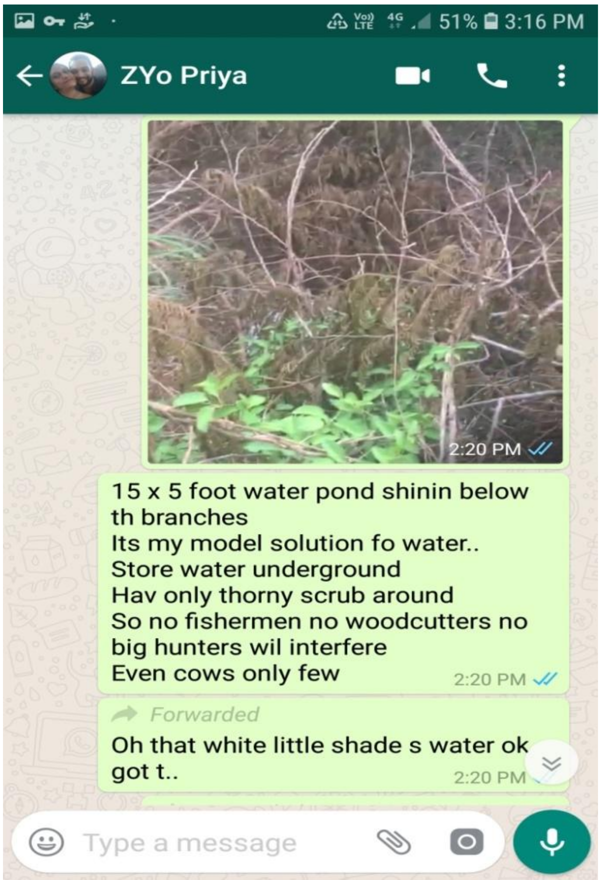
Its my model solution fo water..
Store water underground
Have only thorny scrub around

no fishermenz, no woodcutters, no big hunters interfere
Even cows grazing but only limited few

On a portion of the whole lake.. 10 – 30 acres..
Min.. 0.5 – 3 acres - our 3 acres hasn't dried up in 6 years now.. despite repeated threats..
Natural groundwater recharge rainwater harvesting etc

Borewells are filled throughout the whole year in 4 villages, not jus during monsoon time
.. and Despite tripling of the populations

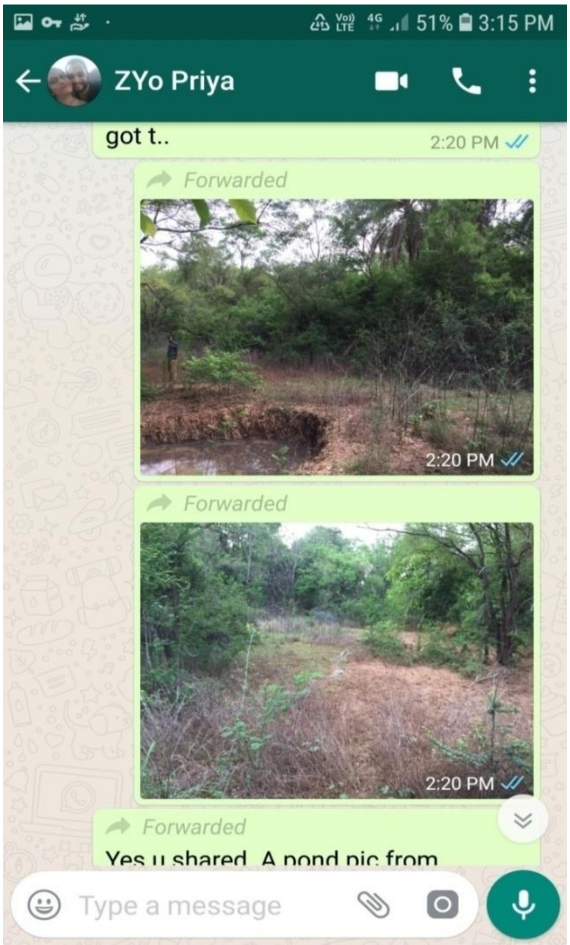
Narayana Gurukula, Bangalore –Successful Perennial Water Restoration


51% 3:16 PM
ZYo Priya
2:20 PM

15 x 5 foot water pond shinin below th branches
Its my model solution fo water..
Store water underground
Hav only thorny scrub around
So no fishermen no woodcutters no big hunters wil interfere
Even cows only few 2:20 PM

Forwarded
Oh that white little shade s water ok got t.. 2:20 PM

Type a message

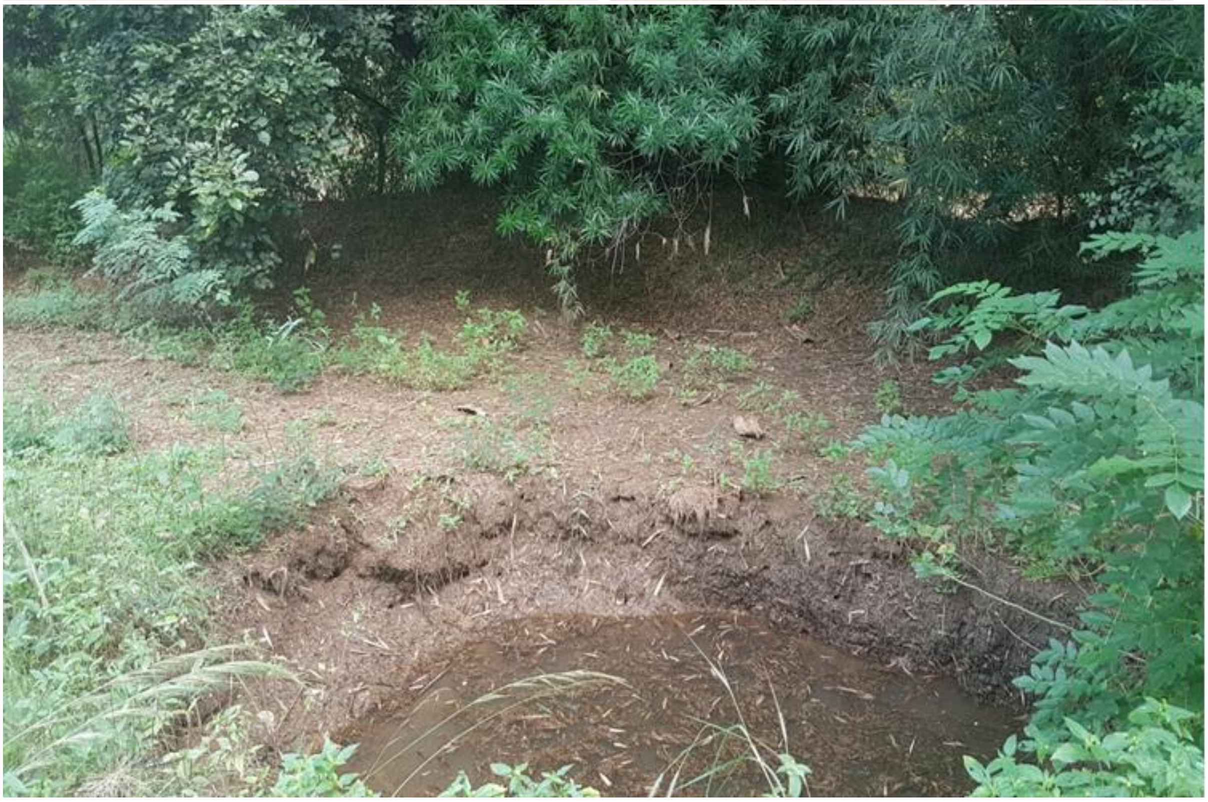

51% 3:15 PM
ZYo Priya

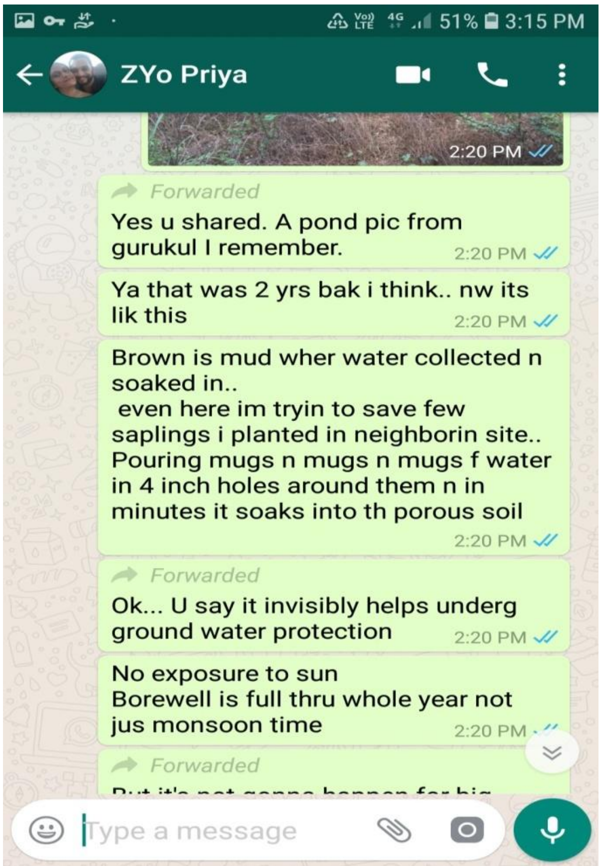
got t.. 2:20 PM

Forwarded
2:20 PM
Forwarded
2:20 PM

Forwarded
Yes u shared A pond pic from

Type a message





2:20 PM

Forwarded
Yes u shared. A pond pic from gurukul I remember. 2:20 PM

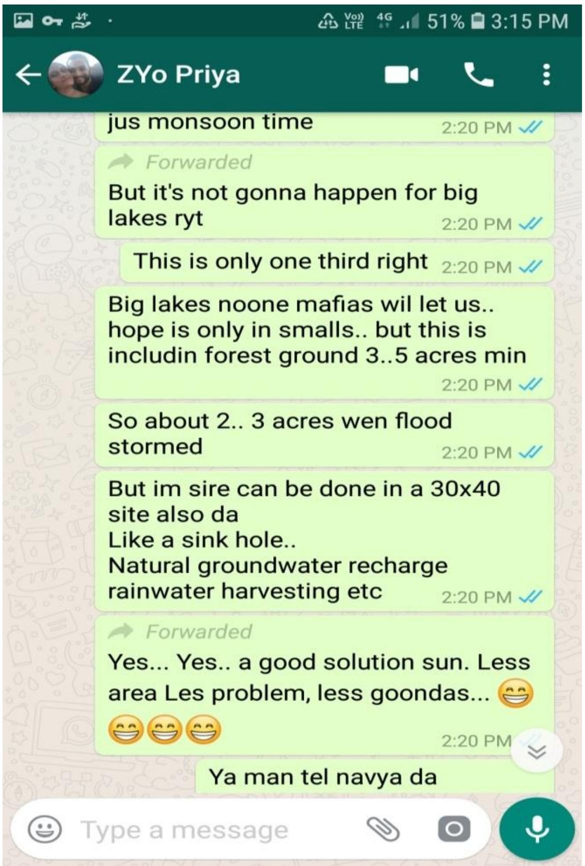
Ya that was 2 yrs bak i think.. nw its lik this 2:20 PM

Brown is mud wher water collected n soaked in..
even here im tryin to save few saplings i planted in neighborin site.. Pouring mugs n mugs n mugs f water in 4 inch holes around them n in minutes it soaks into th porous soil 2:20 PM

Forwarded
Ok... U say it invisibly helps underg ground water protection 2:20 PM

No exposure to sun
Borewell is full thru whole year not jus monsoon time 2:20 PM

Forwarded



jus monsoon time 2:20 PM

Forwarded
But it's not gonna happen for big lakes ryt 2:20 PM

This is only one third right 2:20 PM

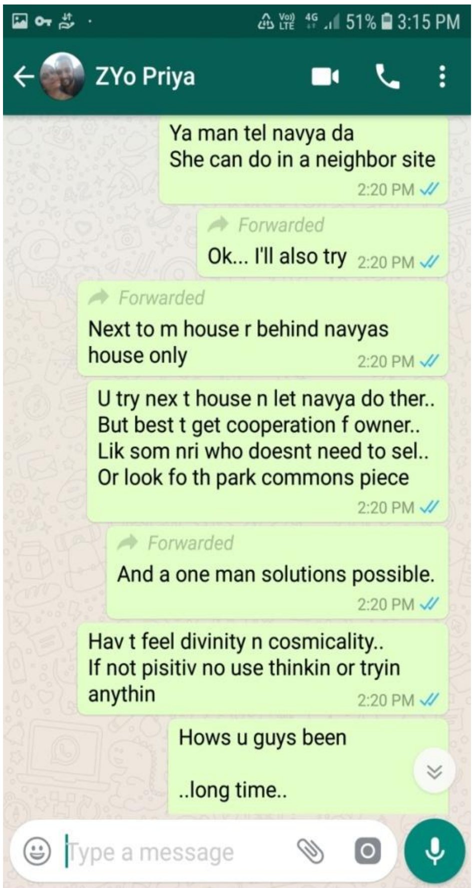
Big lakes noone mafias wil let us.. hope is only in smalls.. but this is includin forest ground 3..5 acres min 2:20 PM

So about 2.. 3 acres wen flood stormed 2:20 PM

But im sire can be done in a 30x40 site also da
Like a sink hole..
Natural groundwater recharge rainwater harvesting etc 2:20 PM

Forwarded
Yes... Yes.. a good solution sun. Less area Les problem, less goondas... 😁
😁😁😁 2:20 PM

Ya man tel navya da



Ya man tel navya da
She can do in a neighbor site
2:20 PM

Forwarded
Ok... I'll also try 2:20 PM

Forwarded
Next to m house r behind navyas
house only
2:20 PM

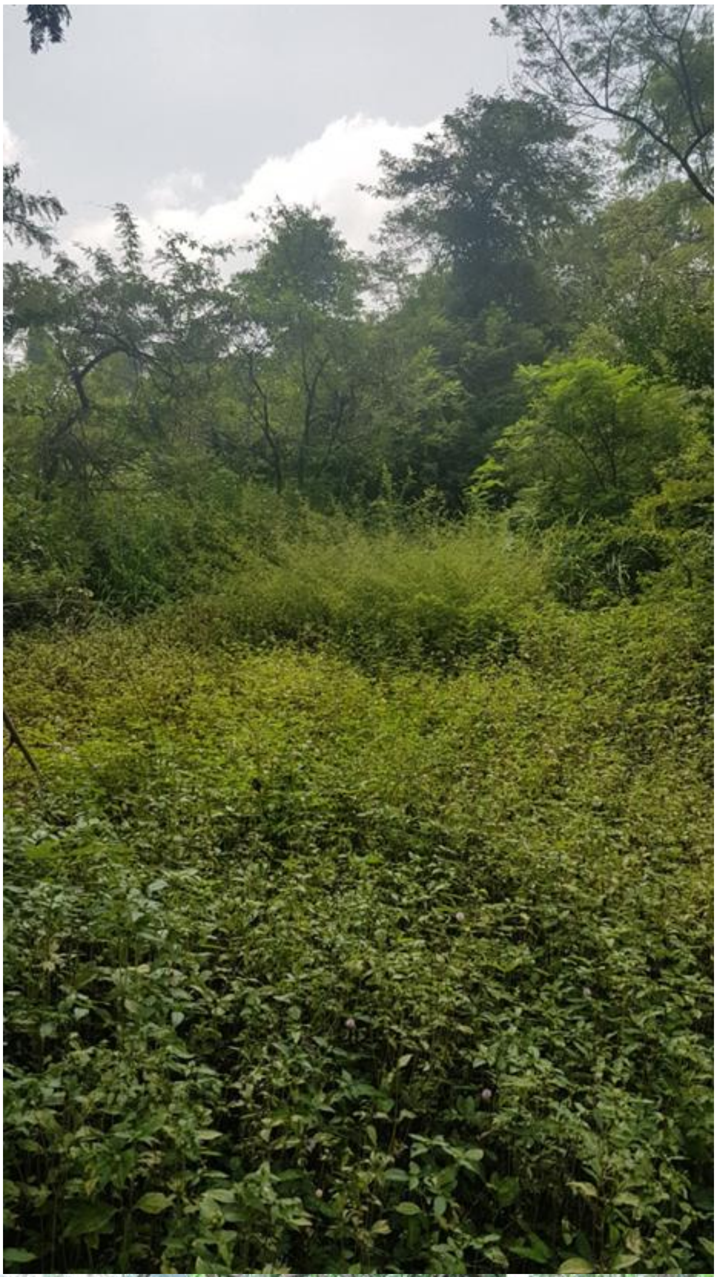
U try nex t house n let navya do ther..
But best t get cooperation f owner..
Lik som nri who doesnt need to sel..
Or look fo th park commons piece
2:20 PM

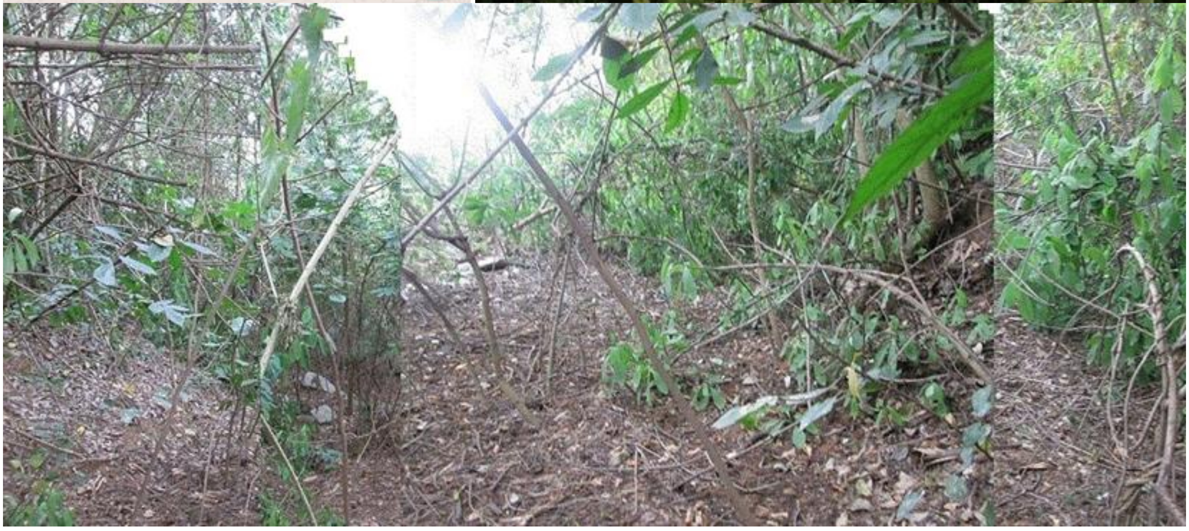
Forwarded
And a one man solutions possible.
2:20 PM

Hav t feel divinity n cosmicality..
If not pisitiv no use thinkin or tryin
anythin
2:20 PM

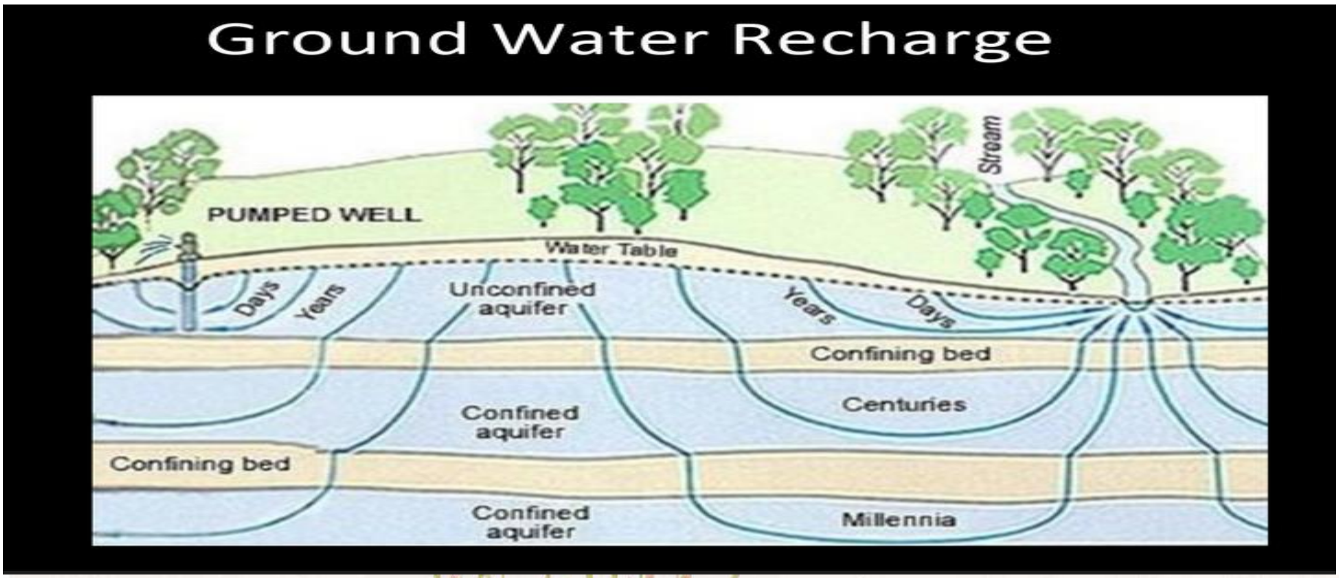
Hows u guys been

..long time..

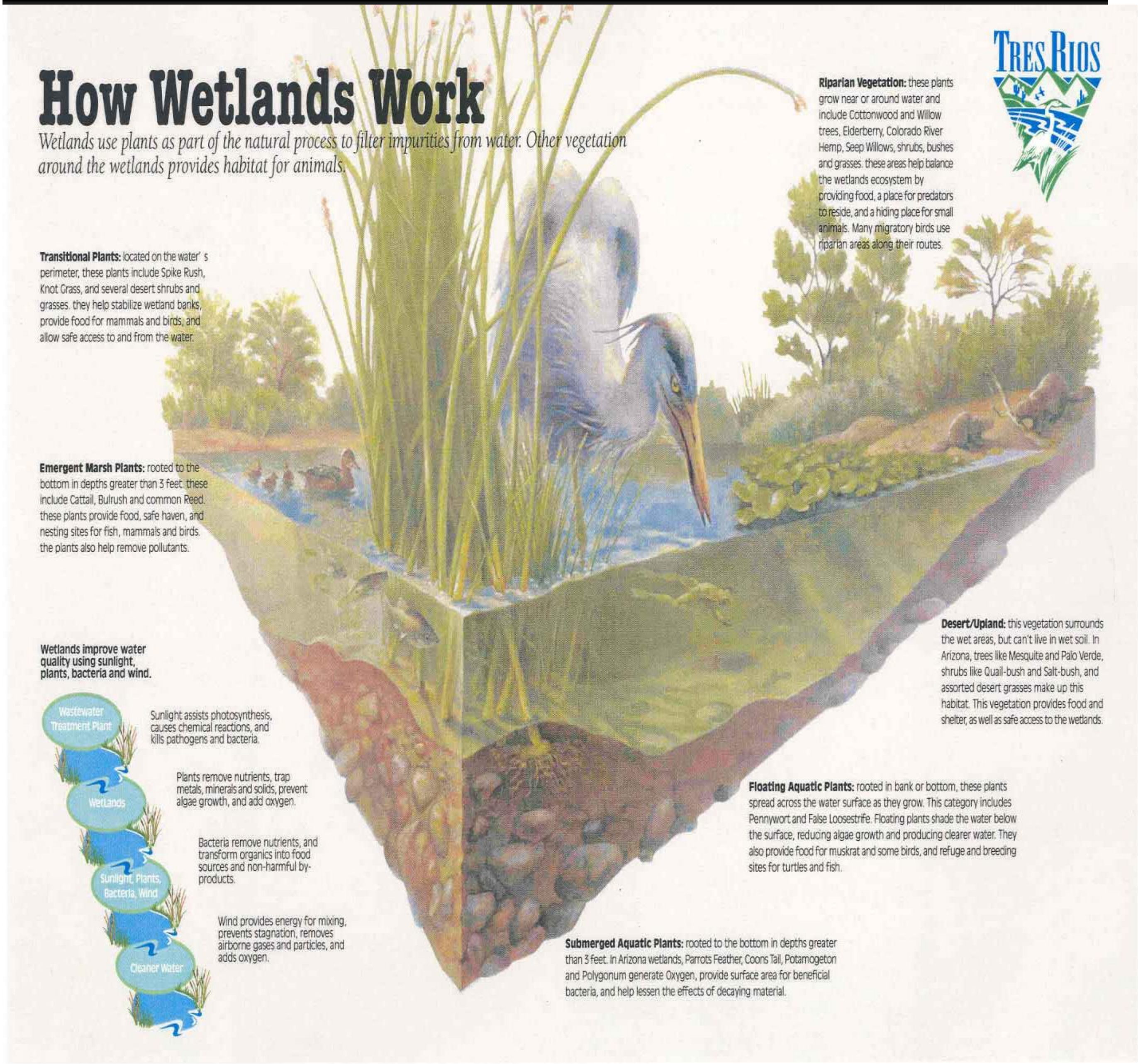




Ideal natural SPONGY **WILD DRAIN** overgrown with vegetation – shrubs and small trees



Ground Water Recharge



How Wetlands Work

Wetlands use plants as part of the natural process to filter impurities from water. Other vegetation around the wetlands provides habitat for animals.

TRES RIOS

Riparian Vegetation: these plants grow near or around water and include Cottonwood and Willow trees, Elderberry, Colorado River Hemp, Seep Willows, shrubs, bushes and grasses. these areas help balance the wetlands ecosystem by providing food, a place for predators to reside, and a hiding place for small animals. Many migratory birds use riparian areas along their routes.

Transitional Plants: located on the water' s perimeter, these plants include Spike Rush, Knot Grass, and several desert shrubs and grasses. they help stabilize wetland banks, provide food for mammals and birds, and allow safe access to and from the water.

Emergent Marsh Plants: rooted to the bottom in depths greater than 3 feet. these include Cattail, Bulrush and common Reed. these plants provide food, safe haven, and nesting sites for fish, mammals and birds. the plants also help remove pollutants.

Wetlands improve water quality using sunlight, plants, bacteria and wind.

Sunlight assists photosynthesis, causes chemical reactions, and kills pathogens and bacteria.

Plants remove nutrients, trap metals, minerals and solids, prevent algae growth, and add oxygen.

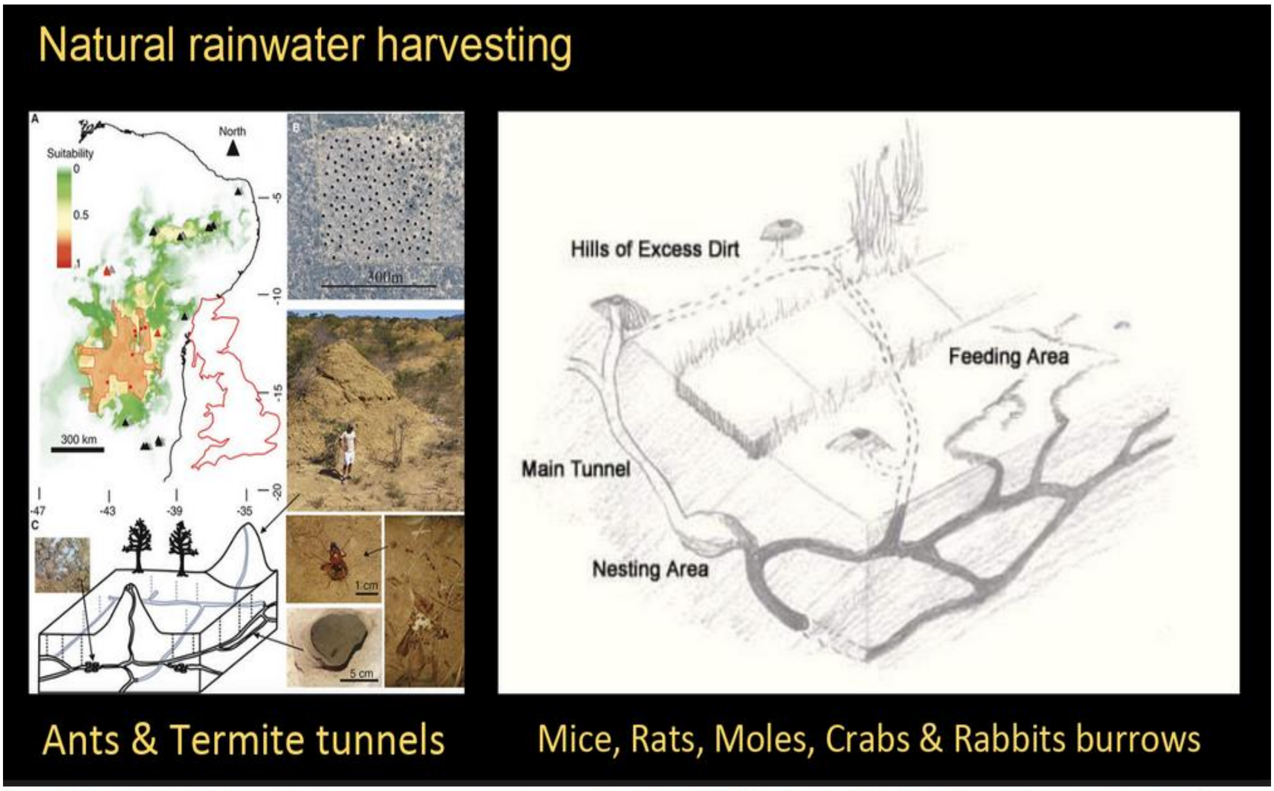
Bacteria remove nutrients, and transform organics into food sources and non-harmful by-products.

Wind provides energy for mixing, prevents stagnation, removes airborne gases and particles, and adds oxygen.

Desert/Upland: this vegetation surrounds the wet areas, but can't live in wet soil. In Arizona, trees like Mesquite and Palo Verde, shrubs like Quail-bush and Salt-bush, and assorted desert grasses make up this habitat. This vegetation provides food and shelter, as well as safe access to the wetlands.

Floating Aquatic Plants: rooted in bank or bottom, these plants spread across the water surface as they grow. This category includes Pennywort and False Loosestrife. Floating plants shade the water below the surface, reducing algae growth and producing clearer water. They also provide food for muskrat and some birds, and refuge and breeding sites for turtles and fish.

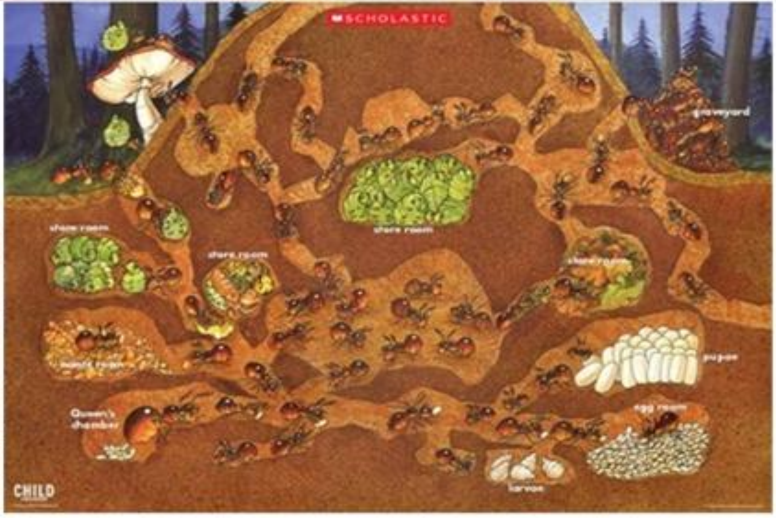
Submerged Aquatic Plants: rooted to the bottom in depths greater than 3 feet. In Arizona wetlands, Parrots Feather, Coons Tail, Potamogeton and Polygonum generate Oxygen, provide surface area for beneficial bacteria, and help lessen the effects of decaying material.

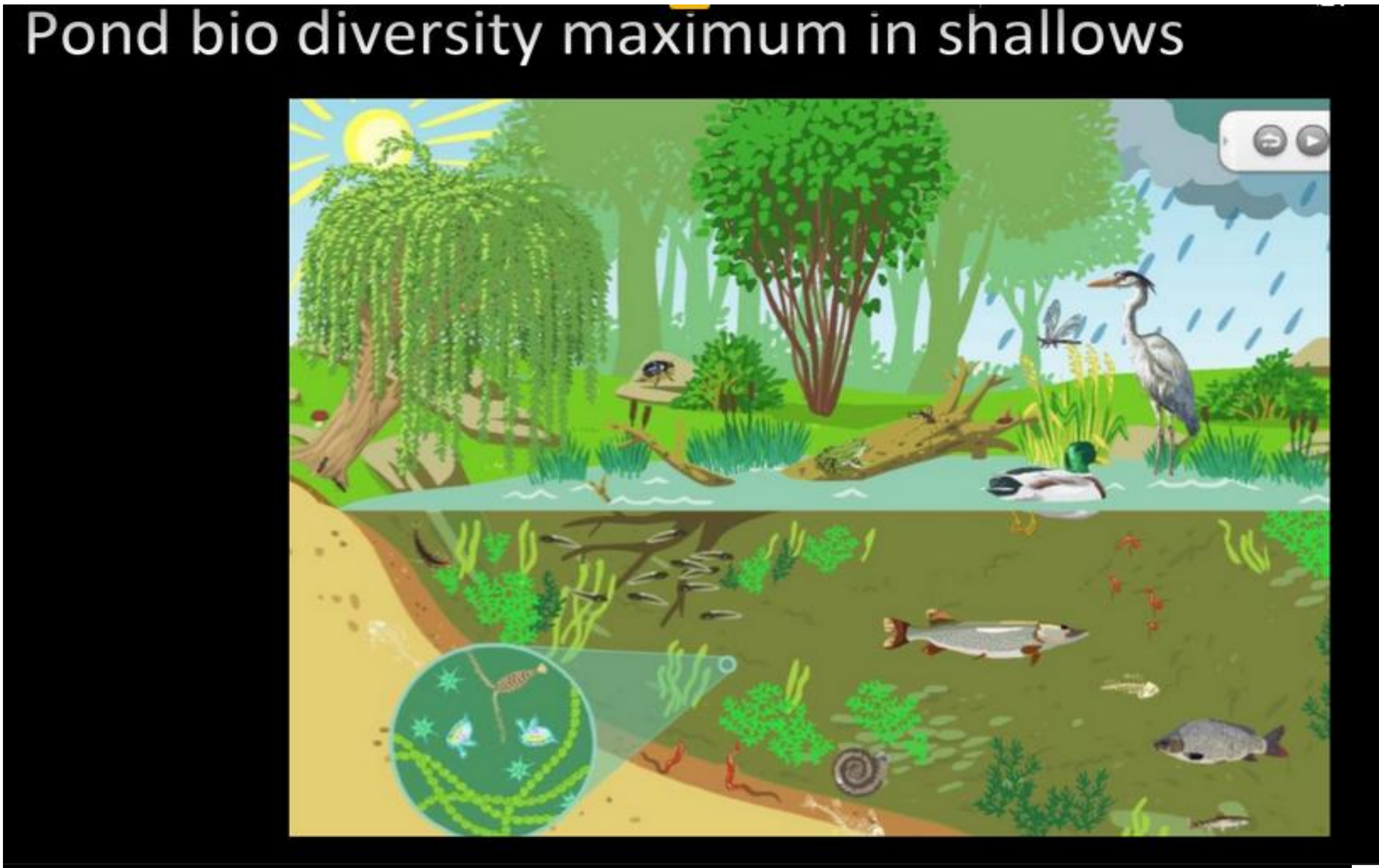

A
Suitability
0
0.5
1
North
300 km
B
300m
-5
-10
-15
-20
-47
-43
-39
-35
C
1 cm
5 cm
Hills of Excess Dirt
Feeding Area
Main Tunnel
Nesting Area

Natural rainwater harvesting

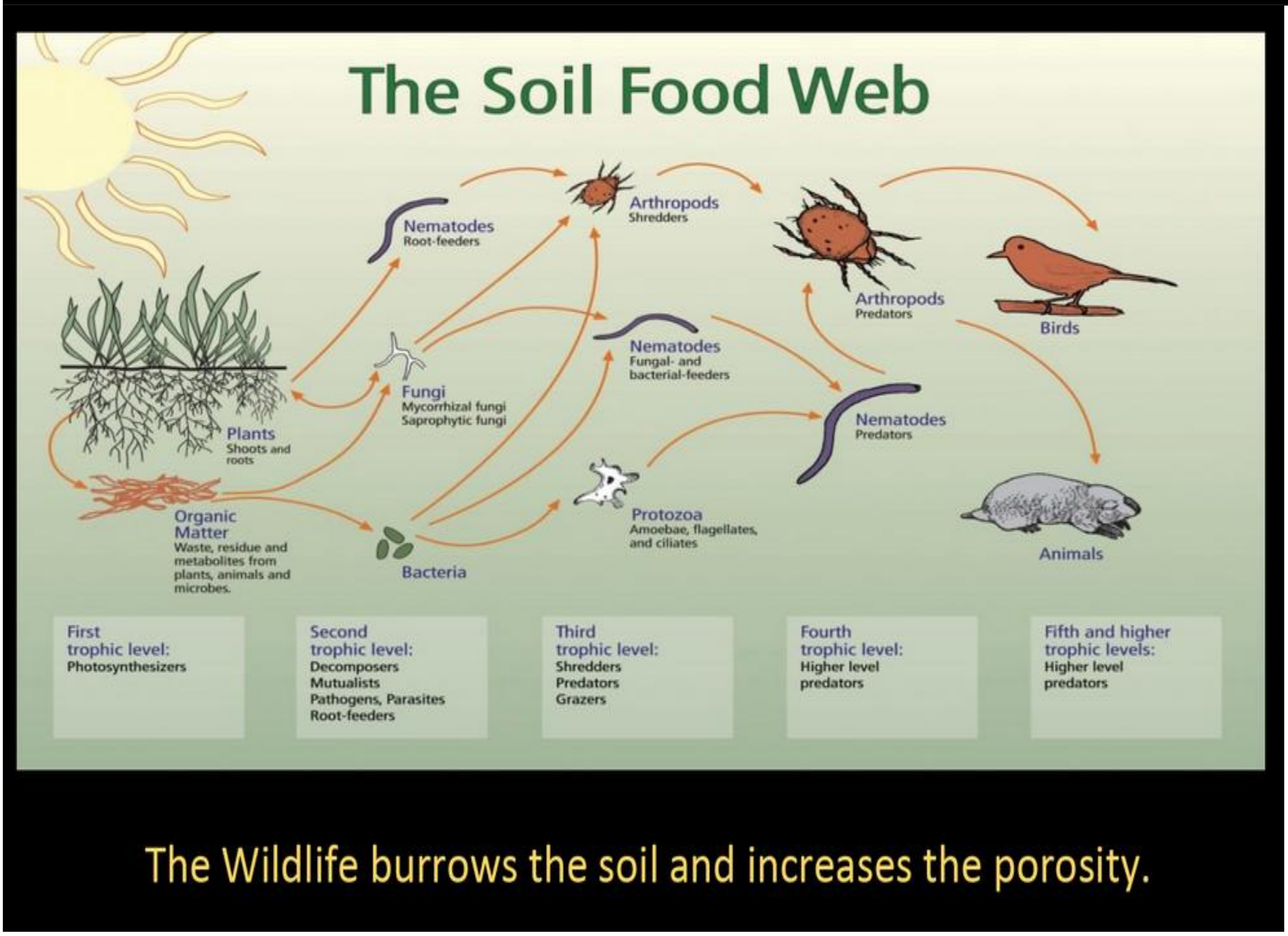
Ants & Termite tunnels

Mice, Rats, Moles, Crabs & Rabbits burrows


SCHOLASTIC
graveyard
store room
store room
store room
store room
waste room
pupae
Queen's chamber
egg room
larvae
CHILD



Pond bio diversity maximum in shallows



The Soil Food Web

Arthropods
Shredders
Nematodes
Root-feeders
Arthropods
Predators
Birds
Nematodes
Fungal- and bacterial-feeders
Fungi
Mycorrhizal fungi
Saprophytic fungi
Plants
Shoots and roots
Nematodes
Predators
Organic Matter
Waste, residue and metabolites from plants, animals and microbes.
Protozoa
Amoebae, flagellates, and ciliates
Bacteria
Animals

First trophic level:
Photosynthesizers

Second trophic level:
Decomposers
Mutualists
Pathogens, Parasites
Root-feeders

Third trophic level:
Shredders
Predators
Grazers

Fourth trophic level:
Higher level predators

Fifth and higher trophic levels:
Higher level predators

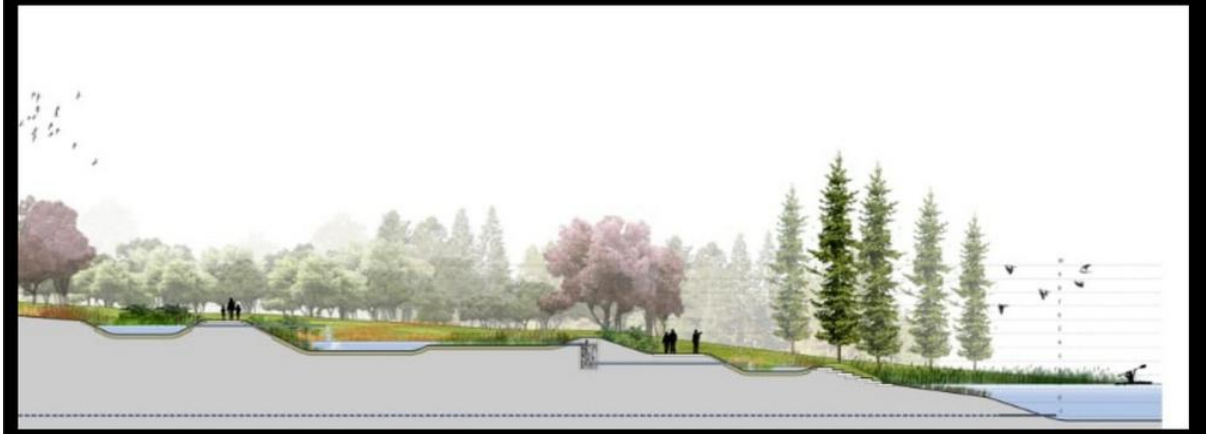
The Wildlife burrows the soil and increases the porosity.

Clean Natural Islands are stand-alone eco systems.

North Sentinel Island SELF-SUFFICIENCY

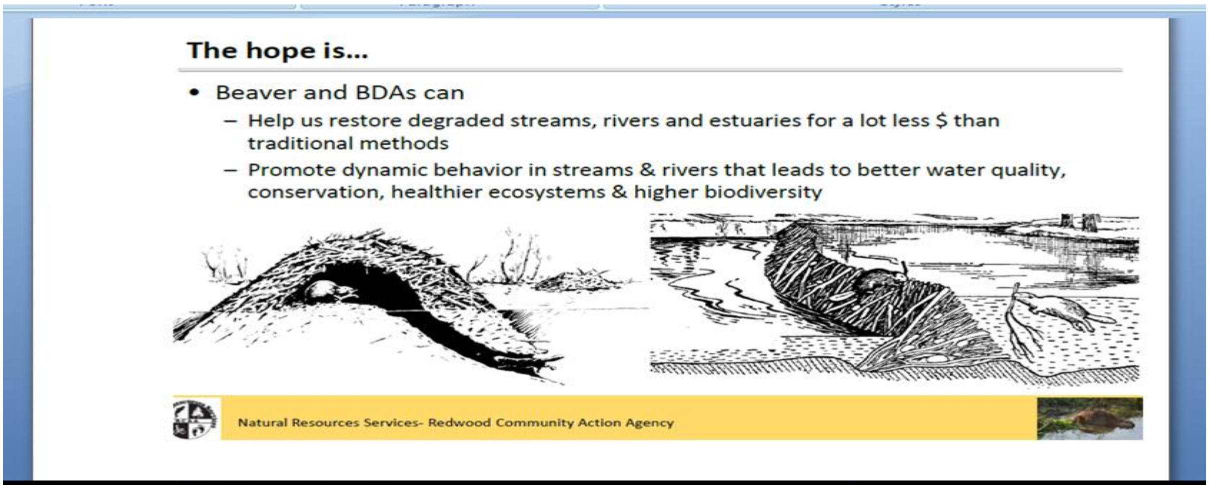
At the same time that they keep strangers out, the coral reefs help keep the Sentinelese in, because the reefs create several shallow lagoons that are teeming with sea life. The food provided by these lagoons is so plentiful that the Sentinelese have never needed to fish in the deep sea waters beyond the coral reefs. They

Section for Lake edging



Natural Edge is structurally stable and crucial for bio-diversity.

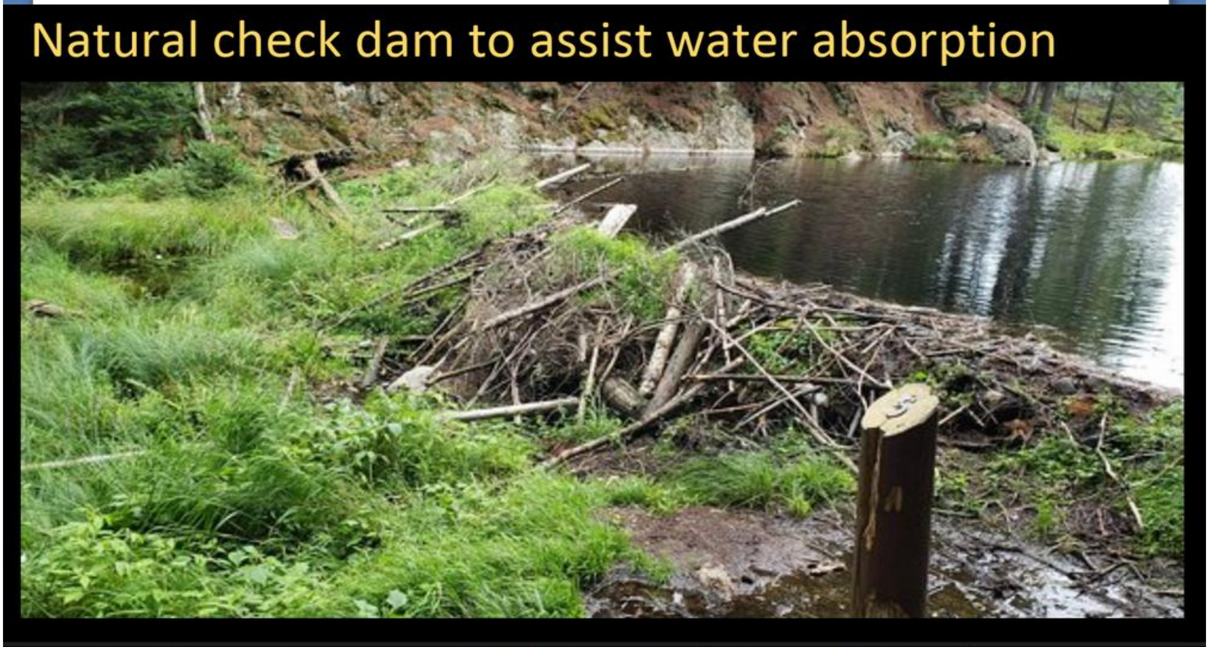
Dividing wall



The hope is…

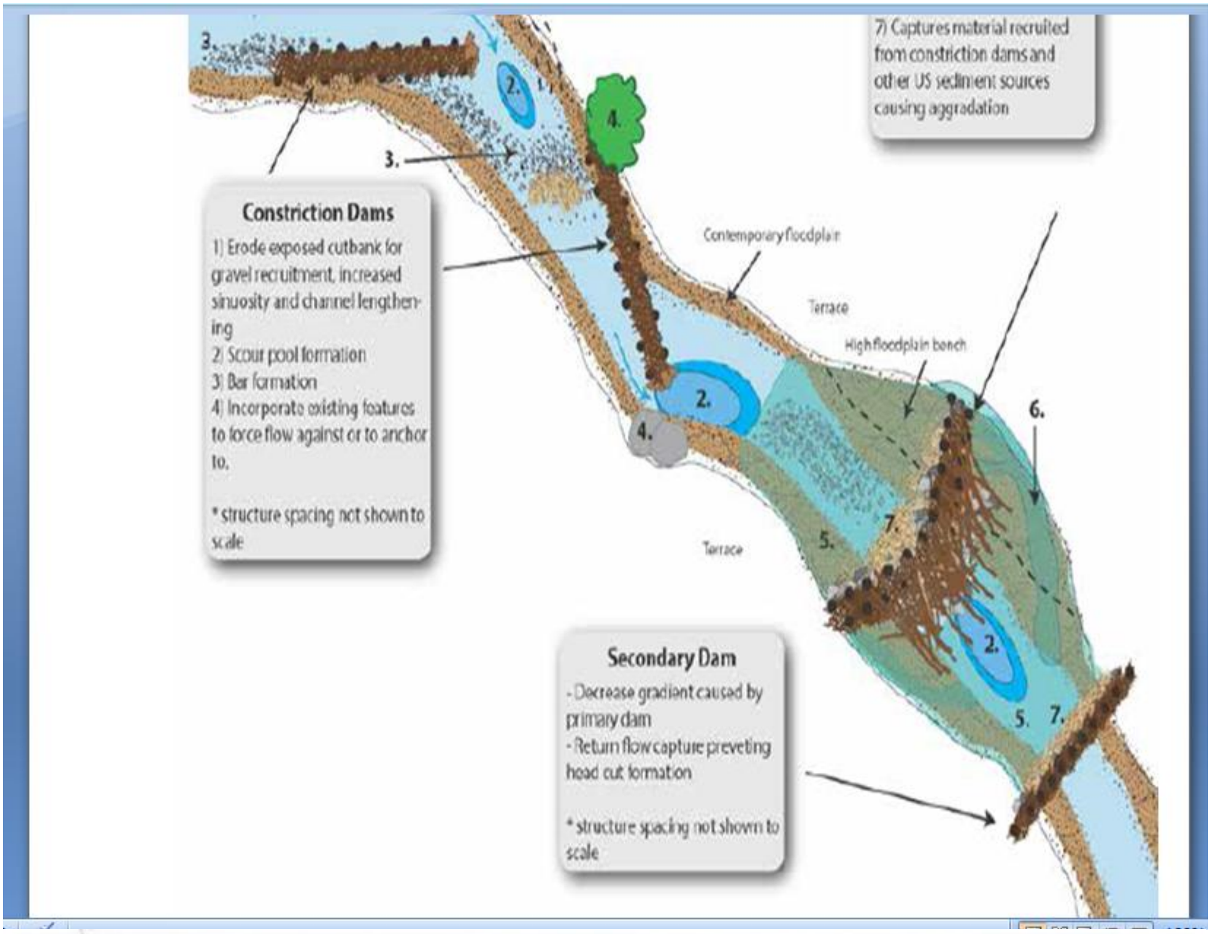
- Beaver and BDAs can
  - Help us restore degraded streams, rivers and estuaries for a lot less $ than traditional methods
  - Promote dynamic behavior in streams & rivers that leads to better water quality, conservation, healthier ecosystems & higher biodiversity

Natural Resources Services- Redwood Community Action Agency



Natural check dam to assist water absorption

Assisting water ecology with natural methods.


3.
2.
1.
4.
3.
Contemporary floodplain
Terrace
High floodplain bench
2.
4.
6.
7.
5.
Terrace
2.
5.
7.

7) Captures material recruited from constriction dams and other US sediment sources causing aggradation

Constriction Dams

1) Erode exposed cutbank for gravel recruitment, increased sinuosity and channel lengthening
2) Scour pool formation
3) Bar formation
4) Incorporate existing features to force flow against or to anchor to.

* structure spacing not shown to scale

Secondary Dam

- Decrease gradient caused by primary dam
- Return flow capture preveting head cut formation

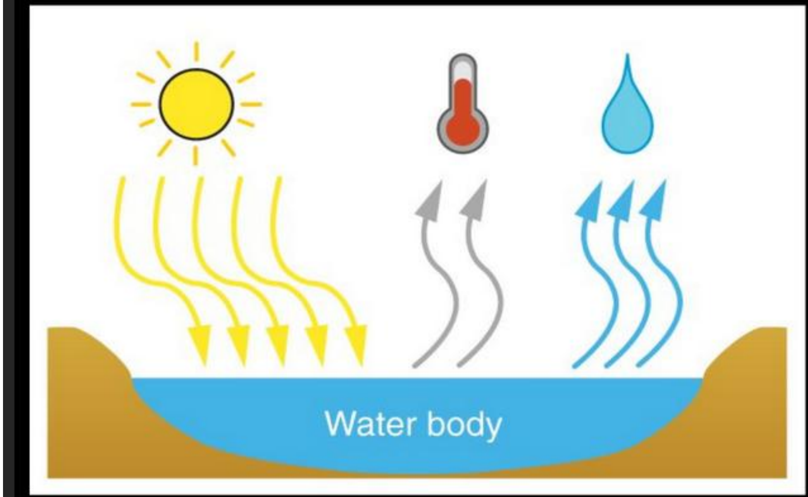
* structure spacing not shown to scale

Design Principles for urban lakes

- Clean water storage underground a healthy spongy grassland.
- Protected sacred wild area.
- Segregation of chemical sewage from the clean lake.
- Treatment of grey water using shallow natural wetland.
- Designated Public space for ecological awareness.
- Providing inspiring spaces to give an experience of art and nature.

- Structural irrelevance of concrete
- Stone pitching – increased mining
- Loss of biodiversity - flora and fauna
- Increases soil erosion and poor water quality

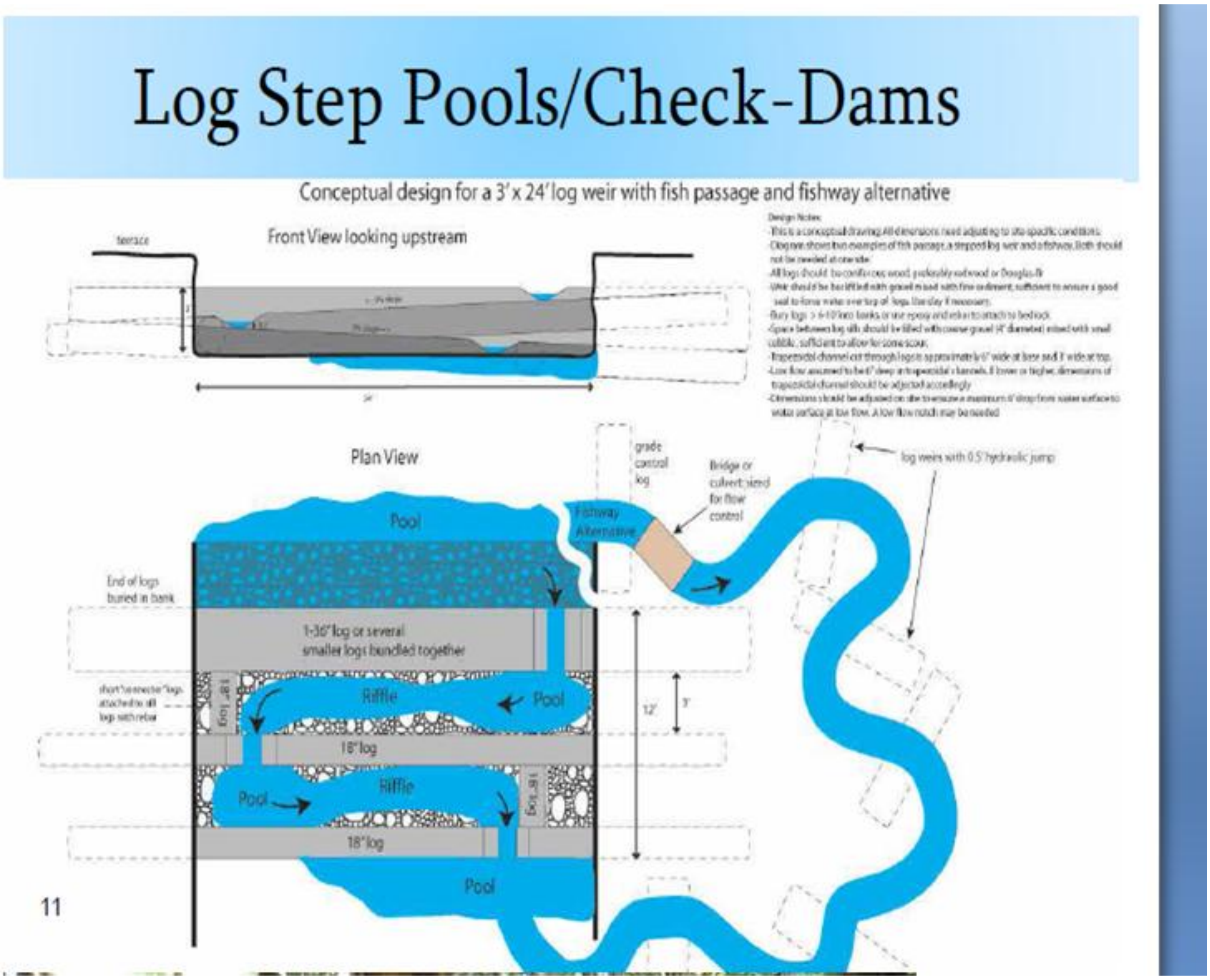
Evaporation Loss – 50%



- Annually 2-3m for open water bodies

Let us do what we do best to conserve water and restore endangered species!

9049493
motionelements.com



Log Step Pools/Check-Dams

Conceptual design for a 3' x 24' log weir with fish passage and fishway alternative

Design Notes:
- This is a conceptual drawing. All dimensions need adjusting to site-specific conditions.
- Diagram shows two examples of fish passage, a stepped log weir and a fishway. Both should not be needed at one site.
- All logs should be coniferous wood, preferably redwood or Douglas-fir
- Weir should be backfilled with gravel mixed with fine sediment, sufficient to ensure a good seal to force water over top of logs. Use clay if necessary.
- Bury logs > 6-10' into banks or use epoxy and rebar to attach to bedrock.
- Space between log sills should be filled with coarse gravel (4" diameter) mixed with small cobble, sufficient to allow for some scour.
- Trapezoidal channel cut through logs is approximately 6" wide at base and 1' wide at top.
- Low flow assumed to be 6" deep in trapezoidal channels. If lower or higher, dimensions of trapezoidal channel should be adjusted accordingly.
- Dimensions should be adjusted on site to ensure a maximum 6" drop from water surface to water surface at low flow. A low flow notch may be needed.

terrace
Front View looking upstream
3'
24'
Plan View
grade control log
Bridge or culvert sized for flow control
log weirs with 0.5' hydraulic jump
Pool
Fishway Alternative
End of logs buried in bank
1-36" log or several smaller logs bundled together
short "connector" logs attached to all logs with rebar
18" log
Riffle
Pool
12'
3'
18" log
Pool
Riffle
18" log
18" log
Pool
11

Pennsylvania, USA – Urban drain natural buffer

California, USA – Watershed eco community

Algonquin Provincial Park, Ontario, Canada – Monsoon season

Everglades, USA – Spongy Wet land

Silver springs Nature Park, USA – Wild no Entry zone

New Zealand – Natural Grazing land

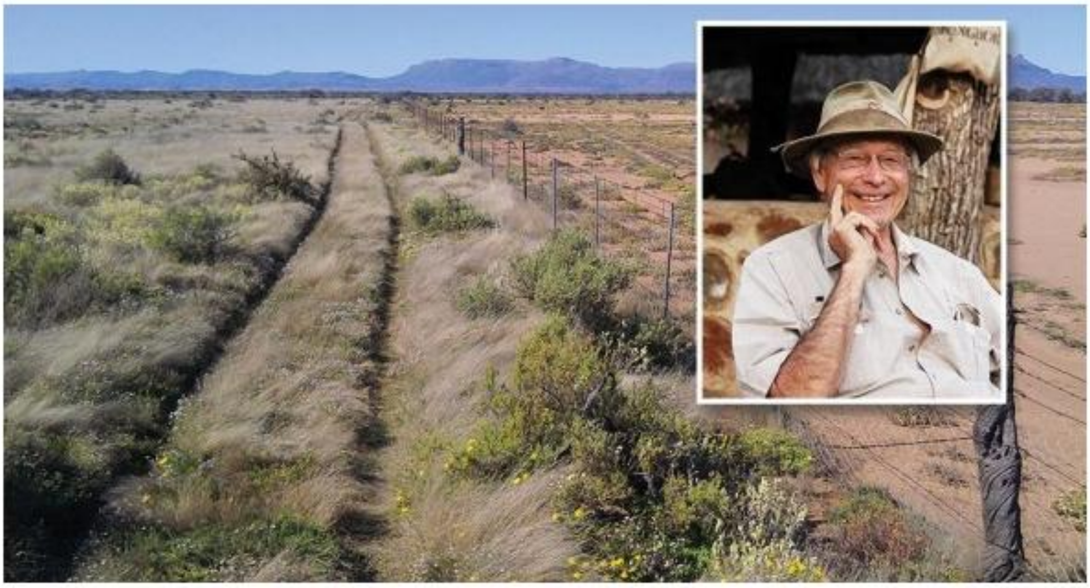
Paynes Prairie State Park, USA – Sacred forest (Devara kaadu)

Tamera Lake, Portugal – Natural Eco village

Marker Wadden, Netherlands – Wild Islands

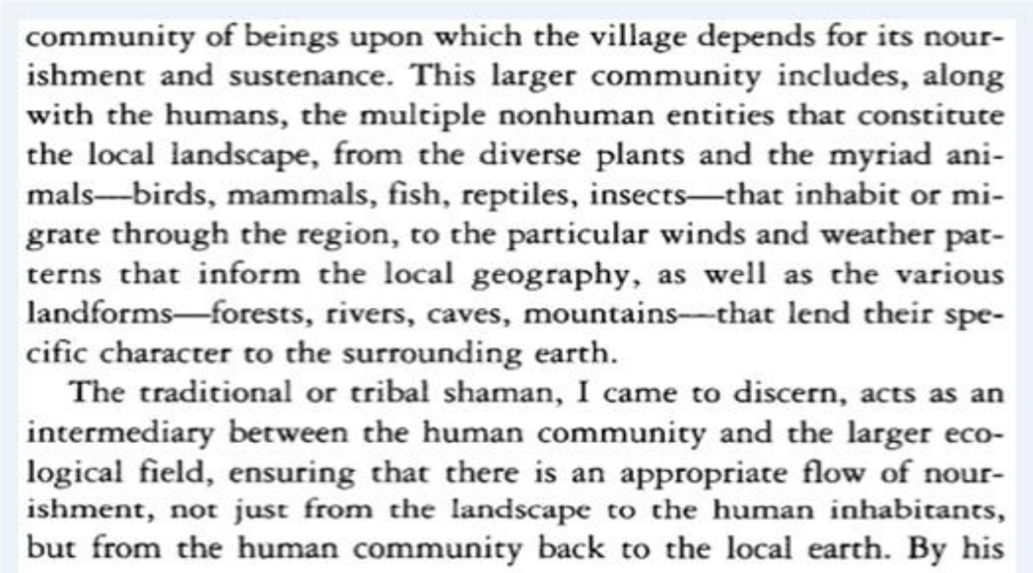
Allan Savory: The Healing of Grassland Deserts

- Oct 31, 2013



by Bruce E. Boyers

Desertification is not a word that many people outside of the scientific community have heard. But in February of this year, a soft-spoken 77-year-old gentleman named Allan Savory walked out on the TED stage in Long Beach, California, and defined it for the audience: "*Desertification* is a fancy word for land that is turning to desert." He showed pictures of grasslands that slowly but surely become very dry and eventually waste away altogether, leaving the ground bare. It is a worldwide problem. While here and there scientists might disagree with Savory and his work, none would likely argue with the fact that half to two-thirds of the open land on Earth is undergoing this process.



community of beings upon which the village depends for its nourishment and sustenance. This larger community includes, along with the humans, the multiple nonhuman entities that constitute the local landscape, from the diverse plants and the myriad animals—birds, mammals, fish, reptiles, insects—that inhabit or migrate through the region, to the particular winds and weather patterns that inform the local geography, as well as the various landforms—forests, rivers, caves, mountains—that lend their specific character to the surrounding earth.

The traditional or tribal shaman, I came to discern, acts as an intermediary between the human community and the larger ecological field, ensuring that there is an appropriate flow of nourishment, not just from the landscape to the human inhabitants, but from the human community back to the local earth. By his

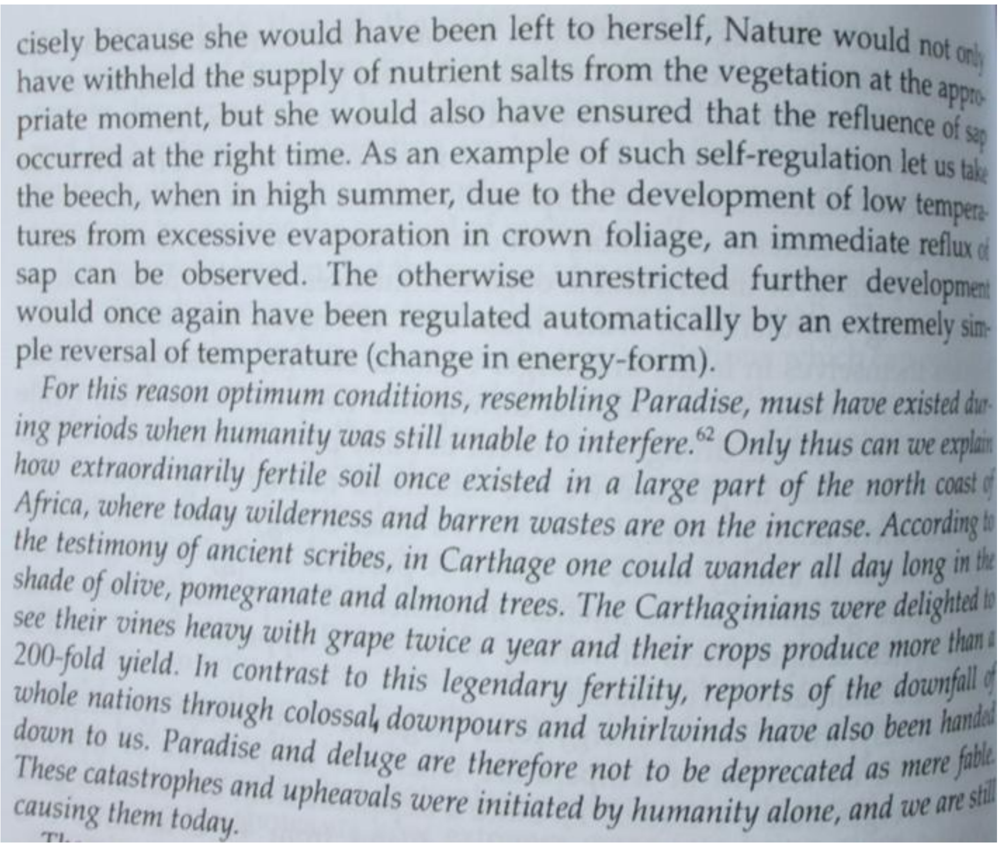
David Abram

community project that generates much citizen participation and pride; and we hope that it will serve as a framework for developing educational materials and tools to serve a wide variety of audiences in the Ojai Valley.

E. Goals

The primary goals of the Ojai Meadows Restoration and Flood Control Plan are:

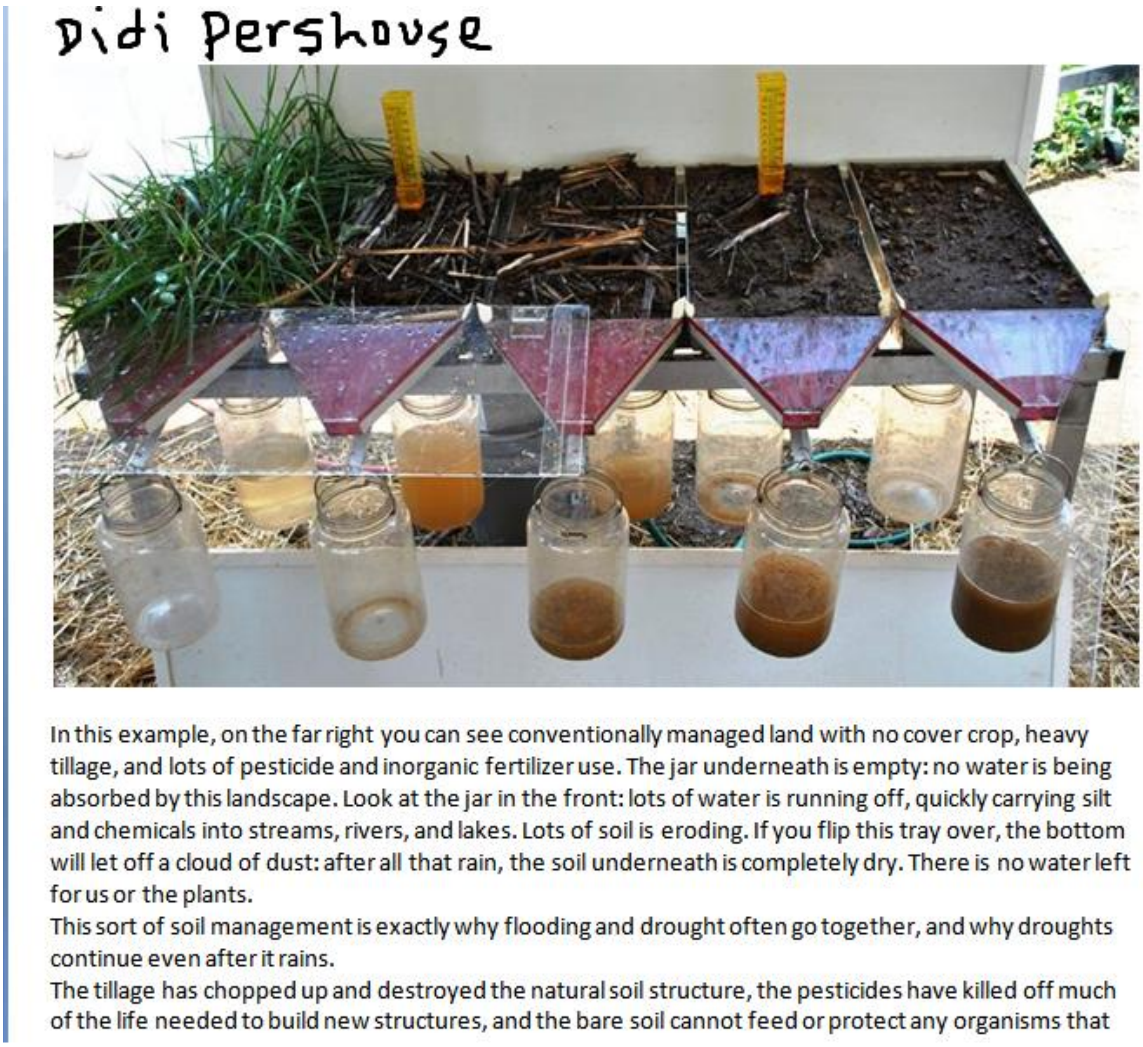
- Create wetlands, oak woodland, oak savanna and native grassland that are healthy and self-sustaining.
- Reduce flooding on Highway 33 and adjacent properties.
- Evaluate the potential for water re-use by Nordhoff High School.
- Promote the physical and biological functions of naturally occurring habitats in the Ojai Valley.
- Facilitate regeneration of native plants and reoccupation by native animals.
- Maximize wildlife and plant diversity and conserve local genotypes.
- Reduce the coverage and impact of invasive weeds.
- Provide pedestrian trails that accommodate existing patterns of movement.
- Facilitate learning about natural systems and appreciation of the Preserve by all visitors.
- Protect the opportunity for solitude, introspection, appreciation and wonder.



cisely because she would have been left to herself, Nature would not only have withheld the supply of nutrient salts from the vegetation at the appropriate moment, but she would also have ensured that the refluence of sap occurred at the right time. As an example of such self-regulation let us take the beech, when in high summer, due to the development of low temperatures from excessive evaporation in crown foliage, an immediate reflux of sap can be observed. The otherwise unrestricted further development would once again have been regulated automatically by an extremely simple reversal of temperature (change in energy-form).

For this reason optimum conditions, resembling Paradise, must have existed during periods when humanity was still unable to interfere.[62] *Only thus can we explain how extraordinarily fertile soil once existed in a large part of the north coast of Africa, where today wilderness and barren wastes are on the increase. According to the testimony of ancient scribes, in Carthage one could wander all day long in the shade of olive, pomegranate and almond trees. The Carthaginians were delighted to see their vines heavy with grape twice a year and their crops produce more than a 200-fold yield. In contrast to this legendary fertility, reports of the downfall of whole nations through colossal, downpours and whirlwinds have also been handed down to us. Paradise and deluge are therefore not to be deprecated as mere fable. These catastrophes and upheavals were initiated by humanity alone, and we are still causing them today.*

V.Schauberger



Didi Pershouse

In this example, on the far right you can see conventionally managed land with no cover crop, heavy tillage, and lots of pesticide and inorganic fertilizer use. The jar underneath is empty: no water is being absorbed by this landscape. Look at the jar in the front: lots of water is running off, quickly carrying silt and chemicals into streams, rivers, and lakes. Lots of soil is eroding. If you flip this tray over, the bottom will let off a cloud of dust: after all that rain, the soil underneath is completely dry. There is no water left for us or the plants.

This sort of soil management is exactly why flooding and drought often go together, and why droughts continue even after it rains.

The tillage has chopped up and destroyed the natural soil structure, the pesticides have killed off much of the life needed to build new structures, and the bare soil cannot feed or protect any organisms that

Druids

The Druid is part of their environment. Through an intimate bond with nature, the Druid is able to move the very forces of nature to cover their tracks, defend themselves or to perform duties. The interesting thing about a Druid's ability, though, is that it is viewed as a natural extension of their unity with nature. Druids are also infamous for planting magical groves. First, a specific type of tree is chosen for it abilities, and then a lot of that species of saplings are planted into a spacious circle. The Druid then visits this grove and meditates in it, ensuring it's health and channelling magical properties into the trees. When these trees are older, they will cooperate with the druid and give what they can to their protector. **For a Druid, being in tune with nature and harmonious with all things is the highest calling.** This does not mean that Druids are unable to use the aggressive magics in their arsenal, but rather that they are only to be used on those that oppose and disrupt a harmonious way of life. A very intelligent and tastefully done mega-resource on Druidism (and pretty much every aspect thereof) can be found at Neopagan.Net.

Primary Tenets

- Druids approach magic using nature as a basis for context and power.
- Druids consider themselves and their magic to be a part of nature, not above it, below it, or outside of its influence.
- People are also a part of nature.
- All nature is sacred, and trees particularly so.

Tamera n sepp holzer

https://www.tamera.org/water-retention-landscape/

https://www.youtube.com/watch?v=K1qTHj6RWVM

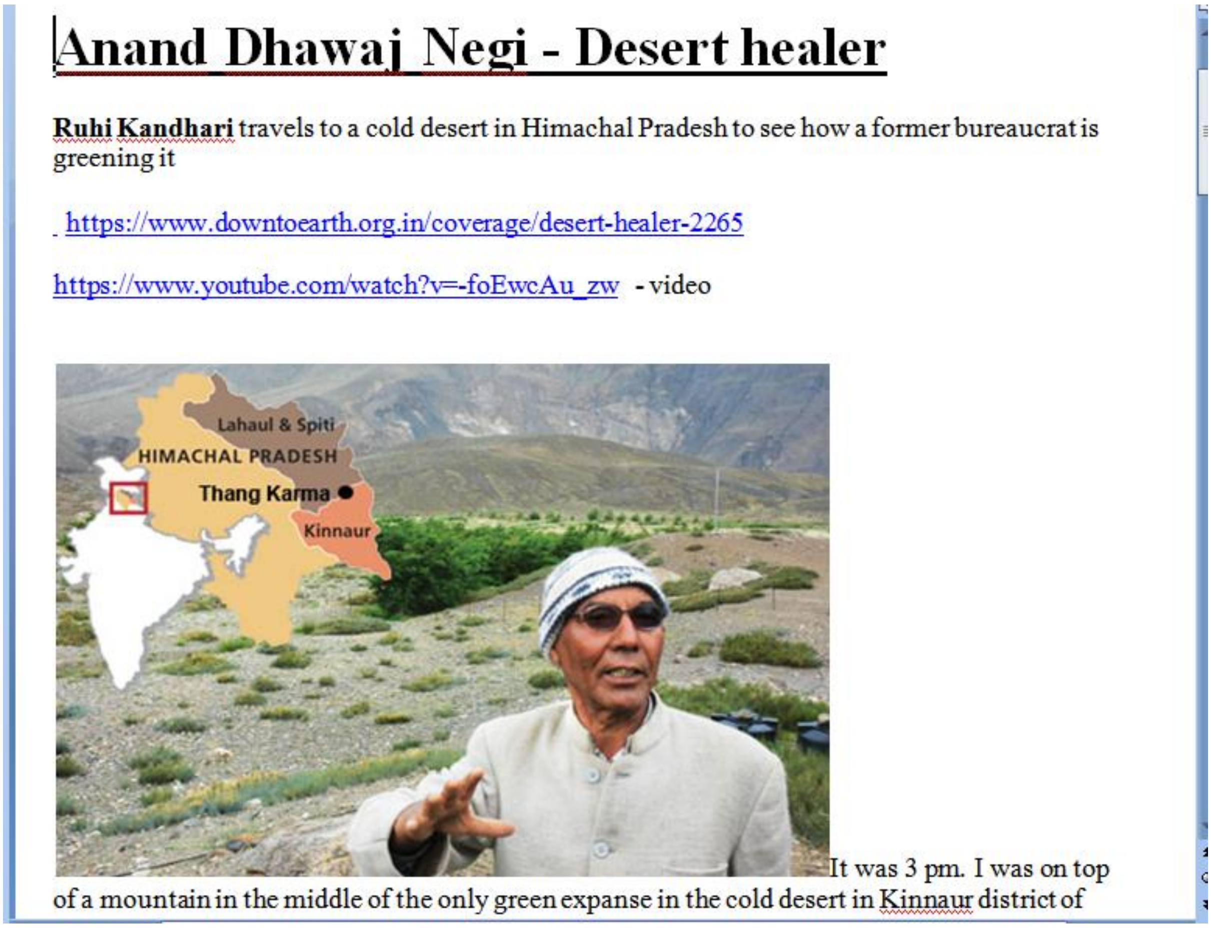
https://www.youtube.com/watch?v=UmXK1dncXLA – john d liu

Water Retention Landscape

The focus of our ecological work is on building the Water Retention Landscape as a far-reaching holistic and regenerative approach for ecosystem restoration. It's a model for natural and decentralized water management, a basis for reforestation, horticulture and agriculture in regions threatened by desertification, and is part of a comprehensive model for sustainability on a large scale that includes water, food, energy and community building.

"Water Retention Landscapes are the healing impulse urgently required by the Earth and all her creatures. They can and must arise in every place where people regain the courage, strength and also of course, the knowledge needed to create them. (…) We must not get accustomed to a state where something that is actually self-evident appears to us as an unrealistic utopia. A world in which all people have free access to sufficient water, energy and food is completely feasible."

BERND MUELLER



Anand Dhawaj Negi - Desert healer

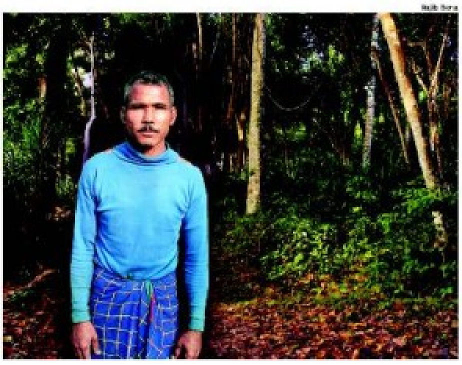
Ruhi Kandhari travels to a cold desert in Himachal Pradesh to see how a former bureaucrat is greening it

https://www.downtoearth.org.in/coverage/desert-healer-2265

https://www.youtube.com/watch?v=-foEwcAu_zw - video

It was 3 pm. I was on top of a mountain in the middle of the only green expanse in the cold desert in Kinnaur district of

Lone Indian Man Plants 1,360 Acre Forest



Jadav “Molai” Payeng By Stephen Messenger

A little over 30 years ago, a teenager named Jadav “Molai” Payeng began burying seeds along a barren sandbar near his birthplace in northern India’s Assam region to grow a refuge for wildlife. Not long after, he decided to dedicate his life to this endeavor, so he moved to the site where he could work full-time creating a lush new forest ecosystem. Incredibly, the spot today hosts a sprawling 1,360 acre of jungle that Payeng planted single-handedly.

It all started way back in 1979 when floods washed a large number of snakes ashore on the sandbar. One day, after the waters had receded, Payeng , only 16 then, found the place dotted with the dead reptiles. That was the turning point of his life.

Pawar first studied the village — the kind of water conservation system available and the different methods that could be adopted for curtailing soil erosion. Presently, the village has **24 cement Bunds** that were constructed **with the help of** the government and **residents**.

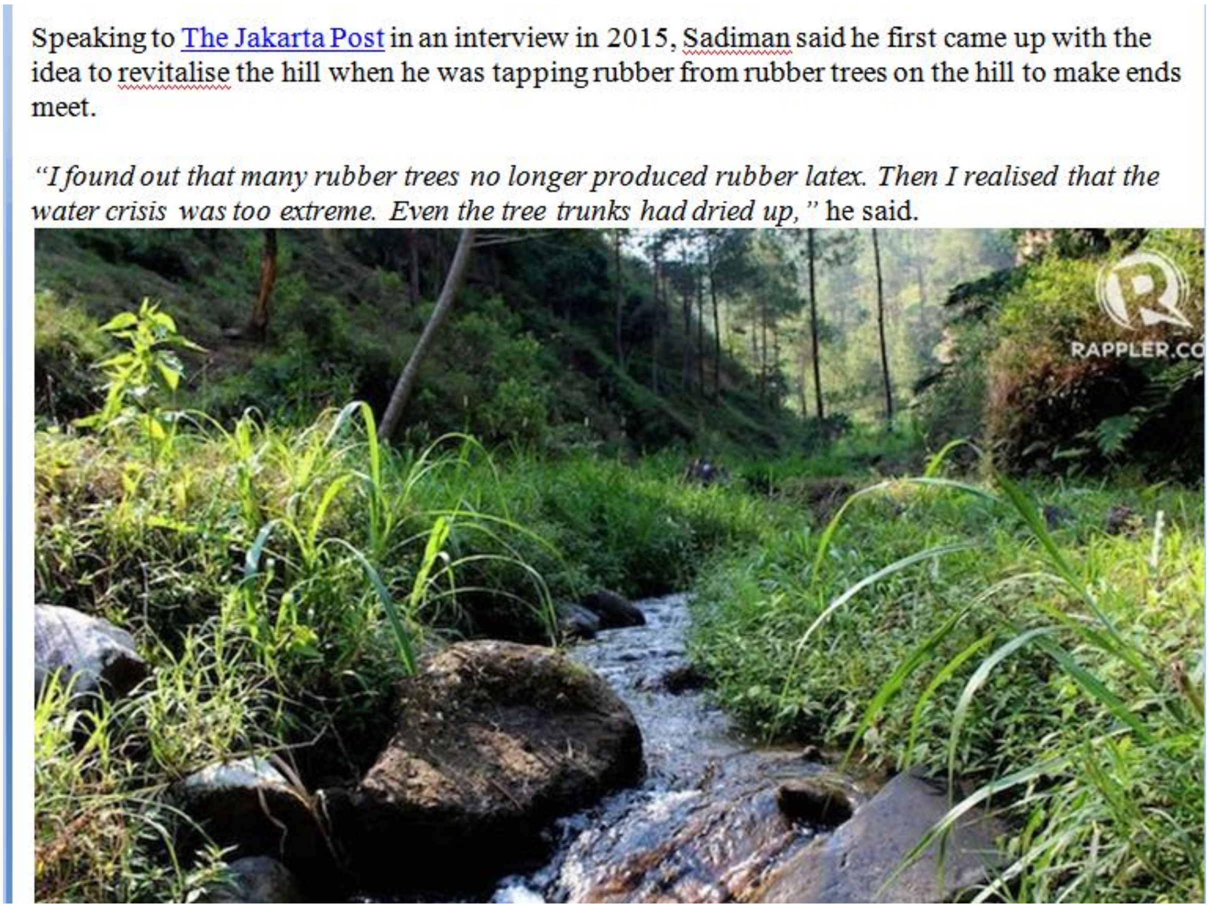
Thereafter, **villagers dug out farm ponds — two–three-metre-deep indents used for storing water. The walls and bases of these ponds were coated with lining paper to avoid infiltration. Presently, there are over 100 such farm ponds in the village. The villagers have also built 3 percolation tanks, and 110 earthen bunds.** Presently, 300 hectares of land here is used for continuous construction bunds.

In **2013**, the **villagers started making attempts to conserve the 500 hectares of Forests. The plucking of plants and cutting of trees was discouraged**. Education provided immense support in terms of **making the villagers aware. “school-going Children understand** the importance of preserving the biodiversity, **& can explain it to parents,”** he says.

The village has an abundant population of chinkara (Indian gazelle), that were frequently attacked by people. Because of the awareness education has brought, the villagers want to protect them, and have even requested the state government for a sum of Rs 1 crore, which will be used to construct more watering holes and introduce specific grass species so that they can graze well.

- Bhaskar Save's farm was the best in the world and full of ground water!

Nanduwali in east Rajasthan started flowing again when the villagers decided to work with nature and not against it. The river is now lifeline to those settled on her banks



Speaking to The Jakarta Post in an interview in 2015, Sadiman said he first came up with the idea to revitalise the hill when he was tapping rubber from rubber trees on the hill to make ends meet.

"I found out that many rubber trees no longer produced rubber latex. Then I realised that the water crisis was too extreme. Even the tree trunks had dried up," he said.

1.11a) The **Chipko** Movement –

In 1730, in Khejarli Village of Rajasthan, the original Chipko Movement was started by the Bishnoi tribe of Rajasthan. A large group of villagers, led by a lady called Amrita Devi, laid down their lives in an effort to protect the Khejri Trees which they regarded as sacred, from being felled on the orders of the Maharaja of Jodhpur. After this incident, the Maharaja gave a strong royal decree preventing the cutting of trees in all Bishnoi villages.

In the 20th century, it began in the hills where the forests are the main source of livelihood, since agriculture cannot be carried out easily here. In 1973, the first Chipko action took place in the village of Mandal in the upper Alakananda Valley and over the next five years it spread to many districts of Uttar Pradesh.

It was sparked off by the government"s decision to allot a plot of forest area in the Alakananda valley to a sports goods company.

Dhoom Singh Negi and Bachni Devi and many other villagers were the first to save trees by hugging them. They coined the slogan

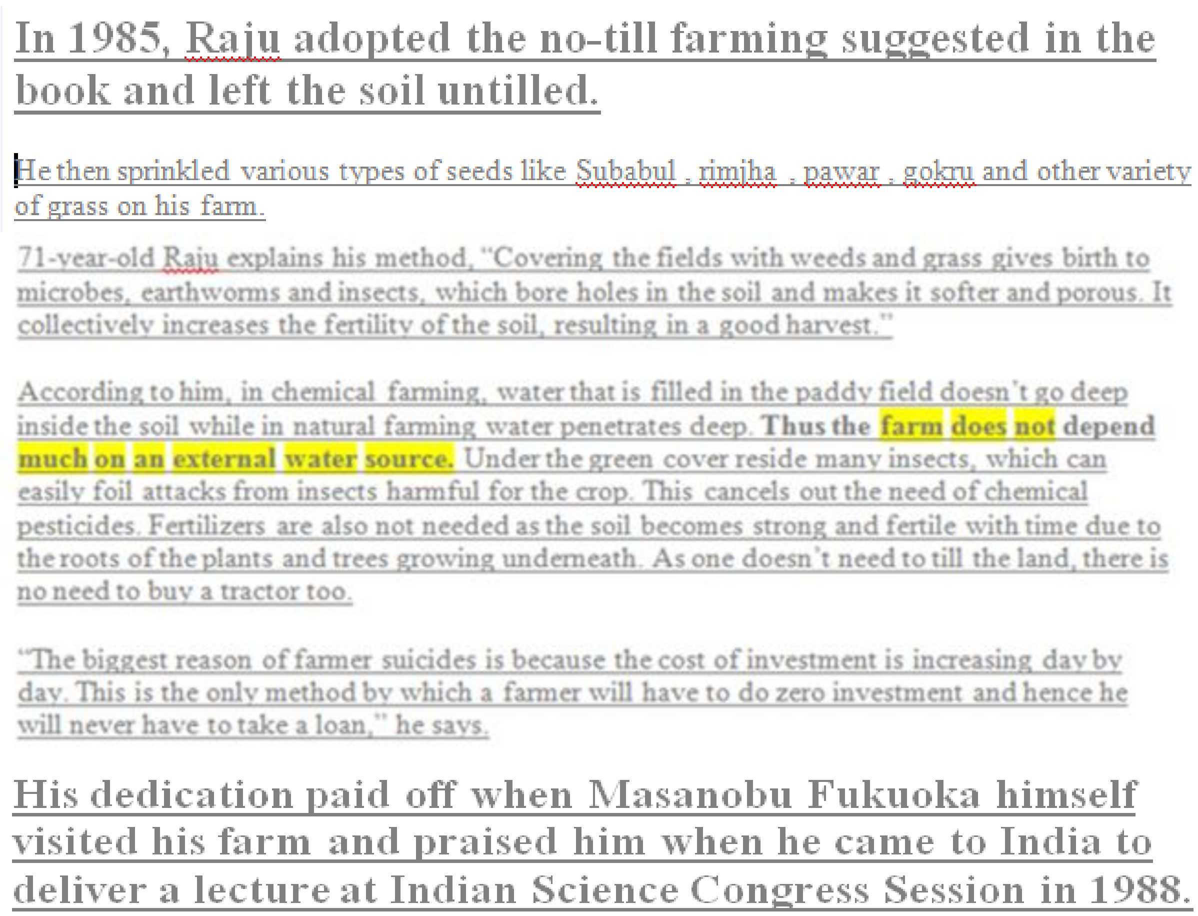
–

"**What do the forests bear? Soil, water and Pure Air**".

Mr. Sunderlal Bahuguna–a Gandhian activist and philosopher, appealed to the then Prime Minister, Mrs. Indira Gandhi, and this resulted in the Green Felling Ban [a 15 year ban <!> on green felling in the Himalayan forests of that state] . He coined the Chipko Slogan

–

"Ecology is permanent economy".



In 1985, Raju adopted the no-till farming suggested in the book and left the soil untilled.

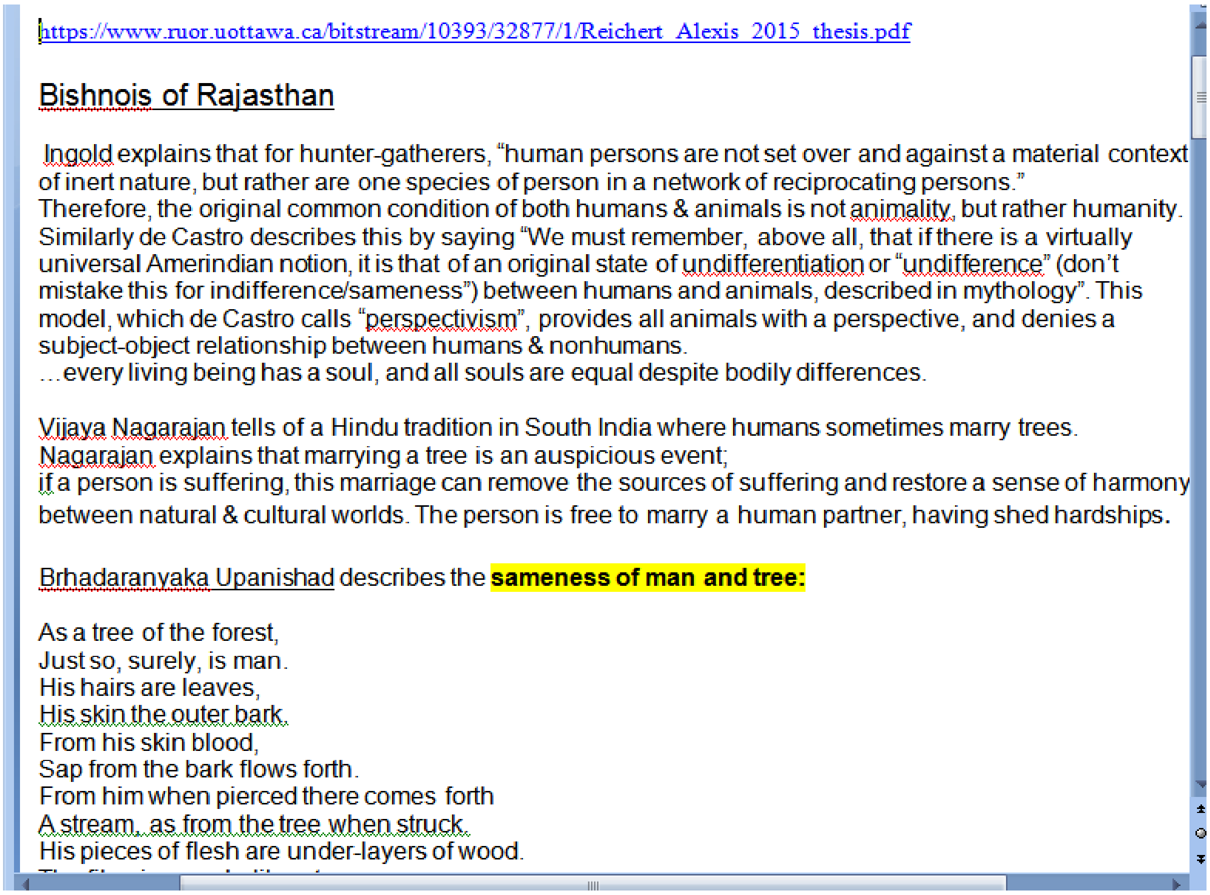
He then sprinkled various types of seeds like Subabul , rimjha , pawar , gokru and other variety of grass on his farm.

71-year-old Raju explains his method, "Covering the fields with weeds and grass gives birth to microbes, earthworms and insects, which bore holes in the soil and makes it softer and porous. It collectively increases the fertility of the soil, resulting in a good harvest."

According to him, in chemical farming, water that is filled in the paddy field doesn't go deep inside the soil while in natural farming water penetrates deep. **Thus the farm does not depend much on an external water source.** Under the green cover reside many insects, which can easily foil attacks from insects harmful for the crop. This cancels out the need of chemical pesticides. Fertilizers are also not needed as the soil becomes strong and fertile with time due to the roots of the plants and trees growing underneath. As one doesn't need to till the land, there is no need to buy a tractor too.

"The biggest reason of farmer suicides is because the cost of investment is increasing day by day. This is the only method by which a farmer will have to do zero investment and hence he will never have to take a loan," he says.

His dedication paid off when Masanobu Fukuoka himself visited his farm and praised him when he came to India to deliver a lecture at Indian Science Congress Session in 1988.



https://www.ruor.uottawa.ca/bitstream/10393/32877/1/Reichert_Alexis_2015_thesis.pdf

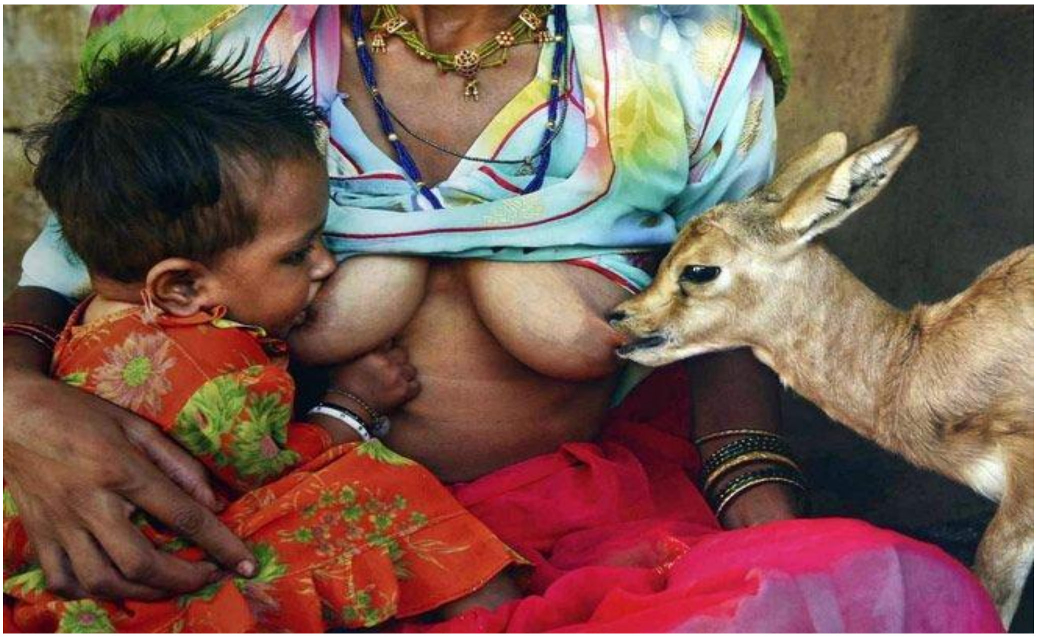
Bishnois of Rajasthan

Ingold explains that for hunter-gatherers, "human persons are not set over and against a material context of inert nature, but rather are one species of person in a network of reciprocating persons."
Therefore, the original common condition of both humans & animals is not animality, but rather humanity.
Similarly de Castro describes this by saying "We must remember, above all, that if there is a virtually universal Amerindian notion, it is that of an original state of undifferentiation or "undifference" (don't mistake this for indifference/sameness") between humans and animals, described in mythology". This model, which de Castro calls "perspectivism", provides all animals with a perspective, and denies a subject-object relationship between humans & nonhumans.
…every living being has a soul, and all souls are equal despite bodily differences.

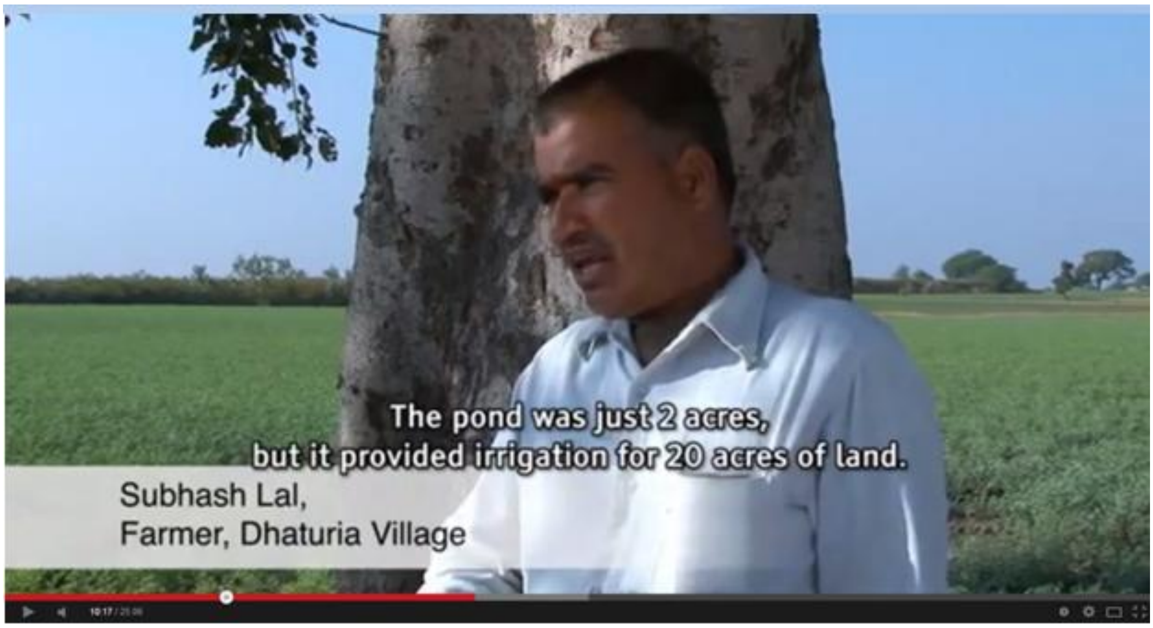
Vijaya Nagarajan tells of a Hindu tradition in South India where humans sometimes marry trees.
Nagarajan explains that marrying a tree is an auspicious event;
if a person is suffering, this marriage can remove the sources of suffering and restore a sense of harmony between natural & cultural worlds. The person is free to marry a human partner, having shed hardships.

Brhadaranyaka Upanishad describes the **sameness of man and tree:**

As a tree of the forest,
Just so, surely, is man.
His hairs are leaves,
His skin the outer bark.
From his skin blood,
Sap from the bark flows forth.
From him when pierced there comes forth
A stream, as from the tree when struck.
His pieces of flesh are under-layers of wood.

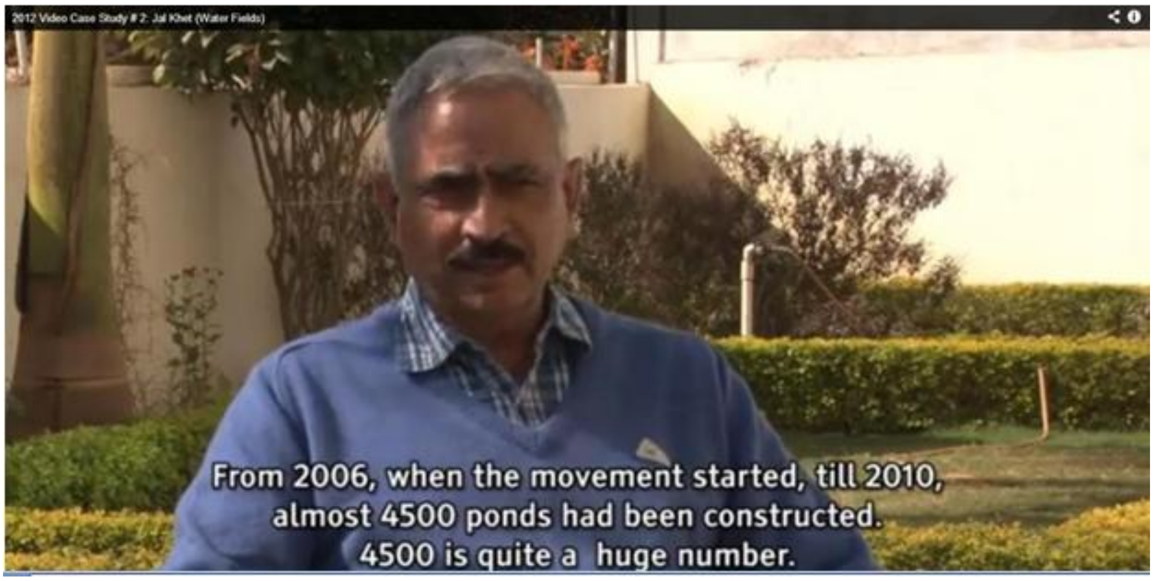


Bishnoi Mom



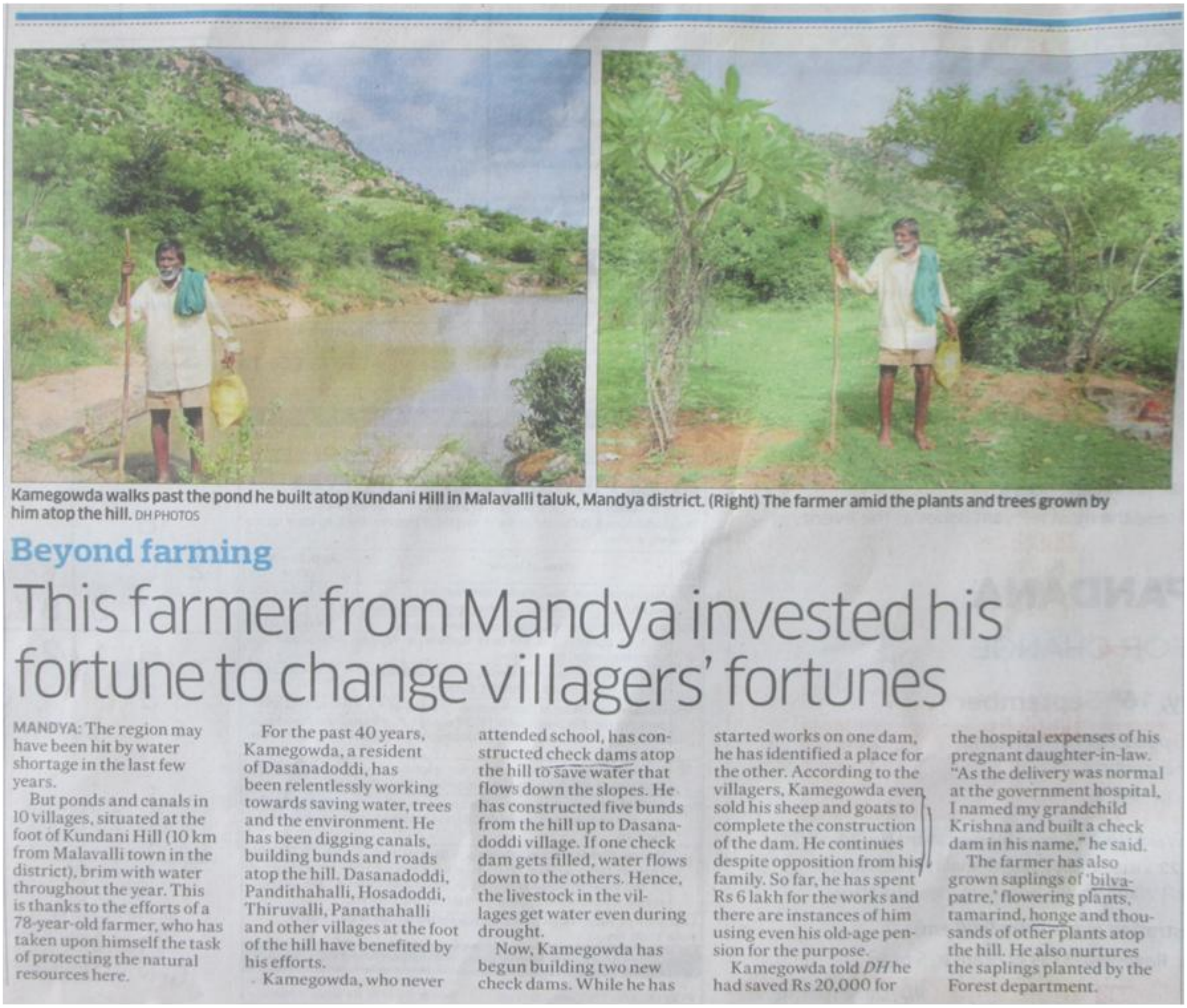
The pond was just 2 acres,
but it provided irrigation for 20 acres of land.

Subhash Lal,
Farmer, Dhaturia Village



2012 Video Case Study # 2: Jal Khet (Water Fields)

From 2006, when the movement started, till 2010,
almost 4500 ponds had been constructed.
4500 is quite a huge number.



Kamegowda walks past the pond he built atop Kundani Hill in Malavalli taluk, Mandya district. (Right) The farmer amid the plants and trees grown by him atop the hill. DH PHOTOS

Beyond farming

This farmer from Mandya invested his fortune to change villagers' fortunes

MANDYA: The region may have been hit by water shortage in the last few years.

But ponds and canals in 10 villages, situated at the foot of Kundani Hill (10 km from Malavalli town in the district), brim with water throughout the year. This is thanks to the efforts of a 78-year-old farmer, who has taken upon himself the task of protecting the natural resources here.

For the past 40 years, Kamegowda, a resident of Dasanadoddi, has been relentlessly working towards saving water, trees and the environment. He has been digging canals, building bunds and roads atop the hill. Dasanadoddi, Pandithahalli, Hosadoddi, Thiruvalli, Panathahalli and other villages at the foot of the hill have benefited by his efforts.

Kamegowda, who never attended school, has constructed check dams atop the hill to save water that flows down the slopes. He has constructed five bunds from the hill up to Dasanadoddi village. If one check dam gets filled, water flows down to the others. Hence, the livestock in the villages get water even during drought.

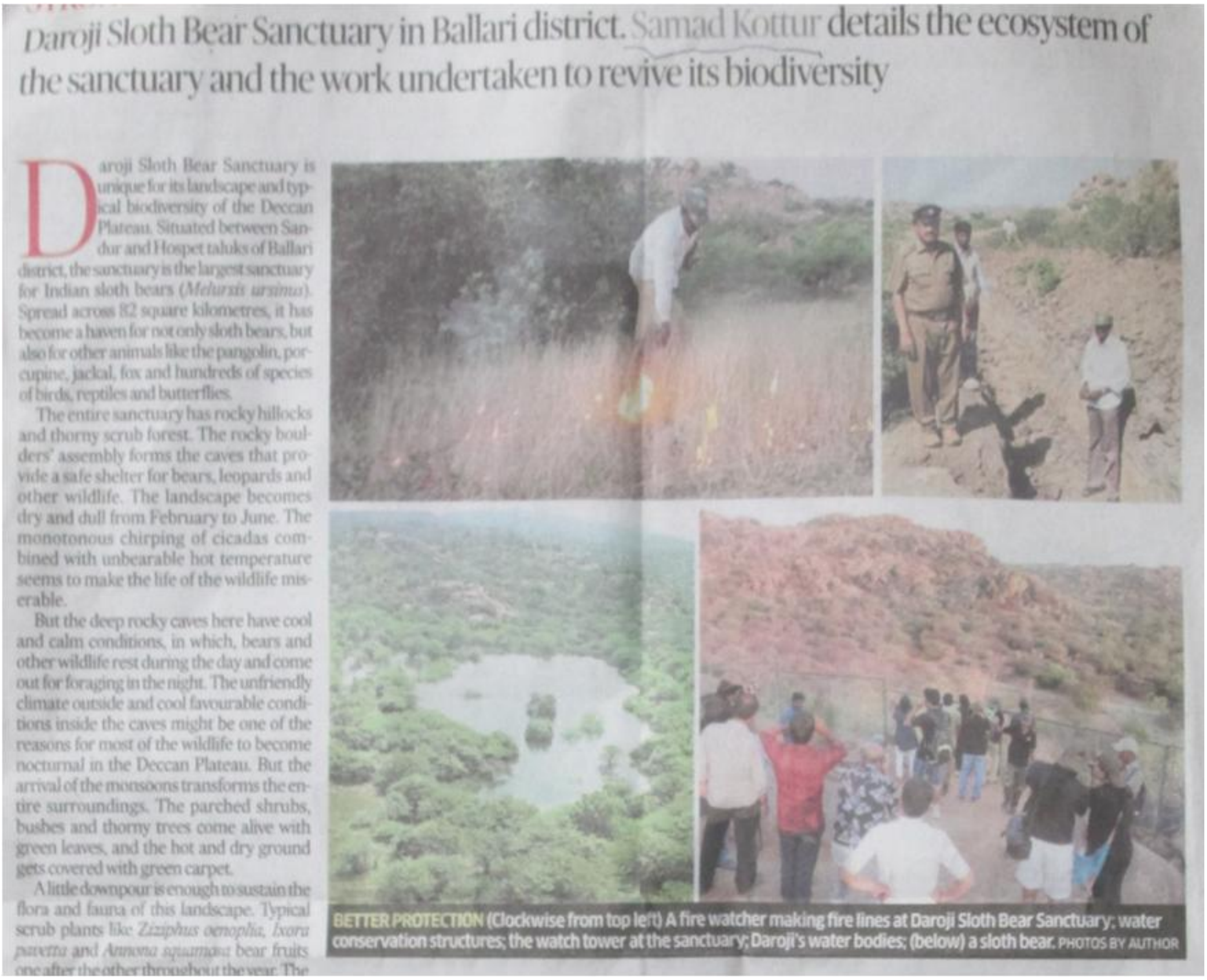
Now, Kamegowda has begun building two new check dams. While he has started works on one dam, he has identified a place for the other. According to the villagers, Kamegowda even sold his sheep and goats to complete the construction of the dam. He continues despite opposition from his family. So far, he has spent Rs 6 lakh for the works and there are instances of him using even his old-age pension for the purpose.

Kamegowda told *DH* he had saved Rs 20,000 for the hospital expenses of his pregnant daughter-in-law. "As the delivery was normal at the government hospital, I named my grandchild Krishna and built a check dam in his name," he said.

The farmer has also grown saplings of 'bilva-patre,' flowering plants, tamarind, honge and thousands of other plants atop the hill. He also nurtures the saplings planted by the Forest department.

I'm always in, and Ravi you have really done a great work, please keep it up.
I'd love to volunteer for you.
Meanwhile, I''ve also started a holistic education and natural organic farming centre in my village in Bihar(India and I invite you all.
Please feel free to come anytime, with family and friends and enjoy nature's goodness with organic food.
I'll keep making more of these centres around India and world to free ourselves from over-dependence on money and markets for everything. We have to end over-commercialization of everything.
Let's stay in touch, no matter where we are, let our hearts be together in love and true friendship—

Rajiv Mishra
for
United Humans Organization
www.unitedhumansorganization.webs.com
Ph & Whatsapp: 0091-7780071987(all are welcome to call/sms or whatsapp me for anything, anytime; just like family)



Daroji Sloth Bear Sanctuary in Ballari district. Samad Kottur details the ecosystem of the sanctuary and the work undertaken to revive its biodiversity

Daroji Sloth Bear Sanctuary is unique for its landscape and typical biodiversity of the Deccan Plateau. Situated between Sandur and Hospet taluks of Ballari district, the sanctuary is the largest sanctuary for Indian sloth bears (*Melursus ursinus*). Spread across 82 square kilometres, it has become a haven for not only sloth bears, but also for other animals like the pangolin, porcupine, jackal, fox and hundreds of species of birds, reptiles and butterflies.

The entire sanctuary has rocky hillocks and thorny scrub forest. The rocky boulders' assembly forms the caves that provide a safe shelter for bears, leopards and other wildlife. The landscape becomes dry and dull from February to June. The monotonous chirping of cicadas combined with unbearable hot temperature seems to make the life of the wildlife miserable.

But the deep rocky caves here have cool and calm conditions, in which, bears and other wildlife rest during the day and come out for foraging in the night. The unfriendly climate outside and cool favourable conditions inside the caves might be one of the reasons for most of the wildlife to become nocturnal in the Deccan Plateau. But the arrival of the monsoons transforms the entire surroundings. The parched shrubs, bushes and thorny trees come alive with green leaves, and the hot and dry ground gets covered with green carpet.

A little downpour is enough to sustain the flora and fauna of this landscape. Typical scrub plants like *Ziziphus oenoplia, Ixora pavetta* and *Annona squamosa* bear fruits one after the other throughout the year. The

BETTER PROTECTION (Clockwise from top left) A fire watcher making fire lines at Daroji Sloth Bear Sanctuary; water conservation structures; the watch tower at the sanctuary; Daroji's water bodies; (below) a sloth bear. PHOTOS BY AUTHOR

Touch-me-not seed vessels, as all know, go off like pistols on the slightest touch, and so suddenly and energetically that they always startle you, though you are expecting it. They shoot their seed like shot. They even explode in my hat as I am bringing them home.

Look under a nut tree a month after the nuts have fallen. . . . The ground looks like a platform before a grocery, where the gossips of the village sit and crack nuts and less savory jokes. You have come, you would say, after the feast was over, and are presented with the shells only.

The scales of all our birch cones are three lobed, like a typical spearhead . . . but those of this species are peculiarly interesting, having the exact form of stately birds with outspread wings, especially of hawks sailing steadily over the fields, and they never fail to remind me of them when I see them under my feet.

It was on the wings of seeds that Thoreau sailed home, where he found peace before he died. Although often itching to travel to the far reaches of the world, and always cosmopolitan in his readings, Thoreau gradually

- H.D.Thoreau

Mishra's intervention was to change all that. Today, Sukhomajri possesses a forest wealth estimated at Rs 90 crore.

The transformation of Sukhomajri from a barren land into a green belt was due to a model of sustainable development called the Chakriya Vikas Pranali (CVP) that was developed by Mishra himself.

The CVP's basic strategy is to make a one-time investment of cash, plants and technology and to convert it into a self-sustaining process of production and reinvestment from a common village fund. The investment in what Mishra calls a 'multi-tiered, multi-rooted, multi-layered' planting cycle guarantees year--round employment for all members of the village society ("students" in CVP terminology) and returns - in the short, medium and longer terms - from grass and vegetables, fruit trees, and timber respectively.

A typical block of 8 or 12 ha of pooled land is divided by water-retaining tie-ridges into smaller quadrants and literally filled with plants, intercropped to maximise the symbiotic relationships of nitrogen-fixing and nitrogen-hungry species. Yams and other tubers go underground, pulses, beans, fruits, bamboo and timber spring up from the earth, the different root systems carefully grown together to prevent overcrowding and to maximise use of groundwater at all levels.

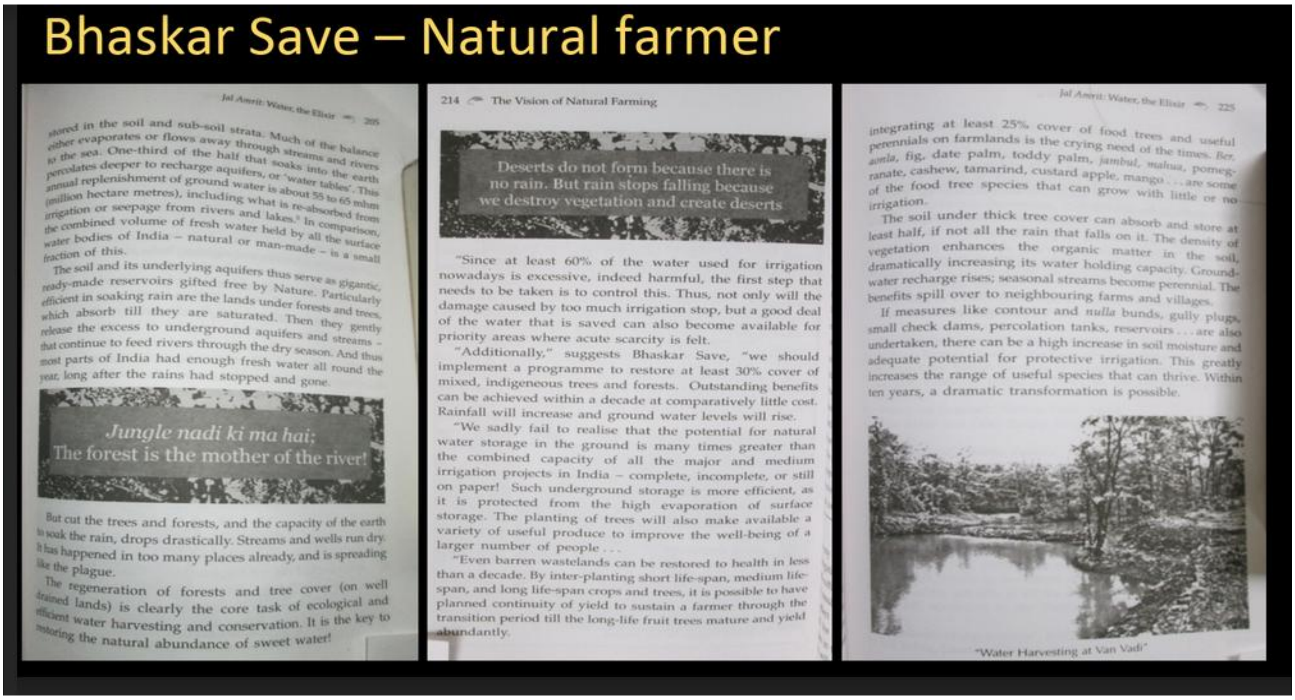
Work began with the percolation tank constructed In the village. In 1975, the tank would not hold water. The embankment wall leaked. Hazare rallied people to voluntarily repair embankment. 7 wells below It swelled with wate for first time In the living memory of the people. In summer, The people reposed their faith In Hazare and his vision.

The villagers took pride In this self-reliance. A new system of sharing labour grew out of this Infusion of pride and voluntary spirit. People volunteered to work on each others' land. Landless labour also gained employment. Today village plans to buy land for them In adjoining villages.

Today, water is abundant, agriculture flourishes In Ralegan, though at a cost, the overuse of fertilisers an pesticides. Prosperity also brings to question the ability of the affluent present generation to carry on the work after Anna. in Anna's words. "The process of Ralegan's evolution will not stop, with changing time people tend to evolve new ways, present a different model..

Sai sanctuary also has a river flowing in the heart which meets the water needs of the animals.

After 23 years, their unmatched passion for wildlife and nature has helped them transform the 55 acres of barren land in 1991 into a **one-of-its-kind wildlife sanctuary spread over 300 acres, probably the only private sanctuary in the country!**



Bhaskar Save – Natural farmer

Jal Amrit: Water, the Elixir 205

stored in the soil and sub-soil strata. Much of the balance either evaporates or flows away through streams and rivers to the sea. One-third of the half that soaks into the earth percolates deeper to recharge aquifers, or 'water tables'. This annual replenishment of ground water is about 55 to 65 mhm (million hectare metres), including what is re-absorbed from irrigation or seepage from rivers and lakes.[3] In comparison, the combined volume of fresh water held by all the surface water bodies of India – natural or man-made – is a small fraction of this.

The soil and its underlying aquifers thus serve as gigantic, ready-made reservoirs gifted free by Nature. Particularly efficient in soaking rain are the lands under forests and trees, which absorb till they are saturated. Then they gently release the excess to underground aquifers and streams – that continue to feed rivers through the dry season. And thus most parts of India had enough fresh water all round the year, long after the rains had stopped and gone.

Jungle nadi ki ma hai;
The forest is the mother of the river!

But cut the trees and forests, and the capacity of the earth to soak the rain, drops drastically. Streams and wells run dry. It has happened in too many places already, and is spreading like the plague.

The regeneration of forests and tree cover (on well drained lands) is clearly the core task of ecological and efficient water harvesting and conservation. It is the key to restoring the natural abundance of sweet water!

214 The Vision of Natural Farming

Deserts do not form because there is no rain. But rain stops falling because we destroy vegetation and create deserts

"Since at least 60% of the water used for irrigation nowadays is excessive, indeed harmful, the first step that needs to be taken is to control this. Thus, not only will the damage caused by too much irrigation stop, but a good deal of the water that is saved can also become available for priority areas where acute scarcity is felt.

"Additionally," suggests Bhaskar Save, "we should implement a programme to restore at least 30% cover of mixed, indigeneous trees and forests. Outstanding benefits can be achieved within a decade at comparatively little cost. Rainfall will increase and ground water levels will rise.

"We sadly fail to realise that the potential for natural water storage in the ground is many times greater than the combined capacity of all the major and medium irrigation projects in India – complete, incomplete, or still on paper! Such underground storage is more efficient, as it is protected from the high evaporation of surface storage. The planting of trees will also make available a variety of useful produce to improve the well-being of a larger number of people . . .

"Even barren wastelands can be restored to health in less than a decade. By inter-planting short life-span, medium life-span, and long life-span crops and trees, it is possible to have planned continuity of yield to sustain a farmer through the transition period till the long-life fruit trees mature and yield abundantly.

Jal Amrit: Water, the Elixir 225

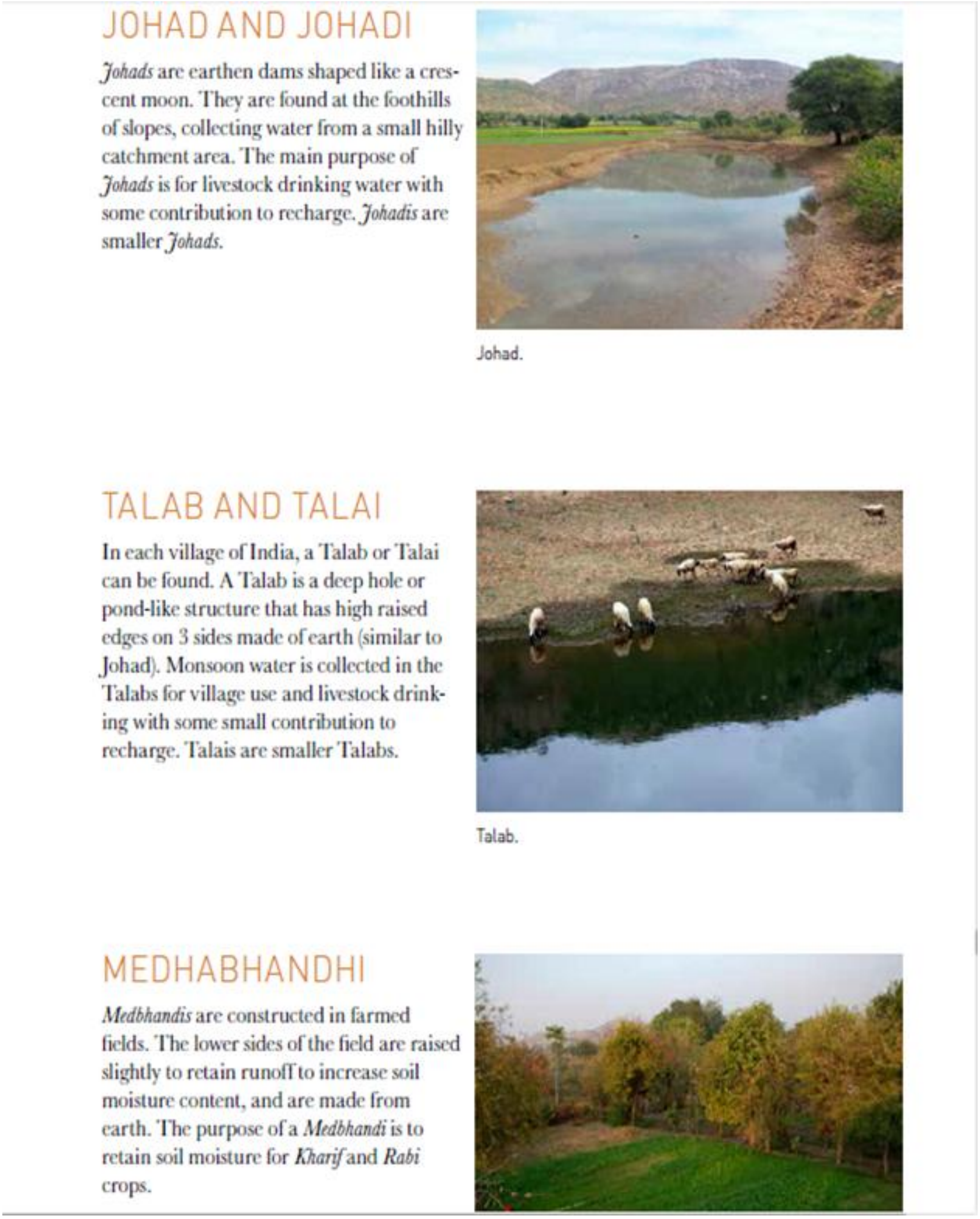
integrating at least 25% cover of food trees and useful perennials on farmlands is the crying need of the times. *Ber, aonla*, fig, date palm, toddy palm, *jambul*, *mahua*, pomegranate, cashew, tamarind, custard apple, mango . . . are some of the food tree species that can grow with little or no irrigation.

The soil under thick tree cover can absorb and store at least half, if not all the rain that falls on it. The density of vegetation enhances the organic matter in the soil, dramatically increasing its water holding capacity. Groundwater recharge rises; seasonal streams become perennial. The benefits spill over to neighbouring farms and villages.

If measures like contour and *nulla* bunds, gully plugs, small check dams, percolation tanks, reservoirs . . . are also undertaken, there can be a high increase in soil moisture and adequate potential for protective irrigation. This greatly increases the range of useful species that can thrive. Within ten years, a dramatic transformation is possible.

"Water Harvesting at Van Vadi"

Rajendra Singh – Tarun Bhagat Sangh



JOHAD AND JOHADI

Johads are earthen dams shaped like a crescent moon. They are found at the foothills of slopes, collecting water from a small hilly catchment area. The main purpose of *Johads* is for livestock drinking water with some contribution to recharge. *Johadis* are smaller *Johads*.

Johad.

TALAB AND TALAI

In each village of India, a Talab or Talai can be found. A Talab is a deep hole or pond-like structure that has high raised edges on 3 sides made of earth (similar to Johad). Monsoon water is collected in the Talabs for village use and livestock drinking with some small contribution to recharge. Talais are smaller Talabs.

Talab.

MEDHABHANDHI

Medbhandis are constructed in farmed fields. The lower sides of the field are raised slightly to retain runoff to increase soil moisture content, and are made from earth. The purpose of a *Medbhandi* is to retain soil moisture for *Kharif* and *Rabi* crops.

Read India
An Imprint of Pratham Books
The First Farmers
A Warli Folktale
Benita Sen
Rajiv Verma 'Banjara'

Rishi krishi Deshpande technique Methodology-

I was confident that our ancestors must have found a way to do this. So I went back to the Vedic texts. I was not disappointed and found that Arya Chanakya has provided a very appropriate shloka which ended the quest.

Kand bijanam chhedlepo, madhudhruten |
Kandanam Asthibijanam Shakudalepah ||
- Arya Chanakya Arthashasta 2,24,24

This means: If the seed is in stick form coat it with honey and ghee (clarified butter) If it is in bulb form or with a hard cover, coat it with wet cow dung.

If you are a farmer you will realise how difficult and impossible appears the procedure laid down in this shloka! No wonder the mantra was neglected by generations of cultivators. I, on the other hand, spent months trying to unlock the wisdom hidden in the mantra. This was followed by field trials involving untiring efforts, successes and failures. My persistence finally paid off. I was successful in implementing the mantra into practice and the word Amrutpani was born.

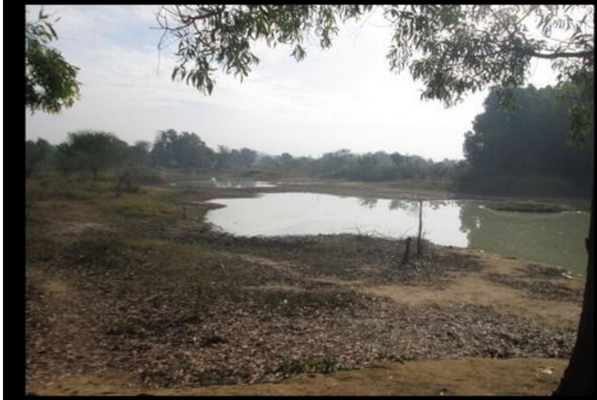
Step 2. Amrut Pani (Nectar water) The second step is the preparation and use of Amrutpani or Nectar water. We all know that Amrut is the heavenly drink which refreshes the gods and has the power to resurrect the dead. In the same manner my Amrutpani invigorates the living soil and

Seasonal changes increases the diversity of ecosystem

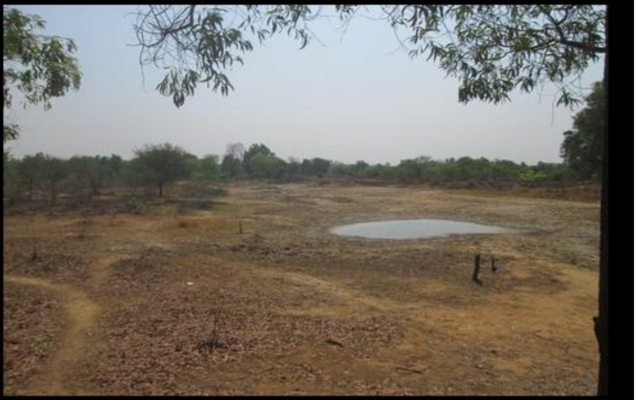
Post monsoon Mist

Each tiny leaf drops so much dew, it adds upto a garden sprinkler.

Autumn drizzle



Pre winter fall



Winter drought

Spring Showers

Spring blooms

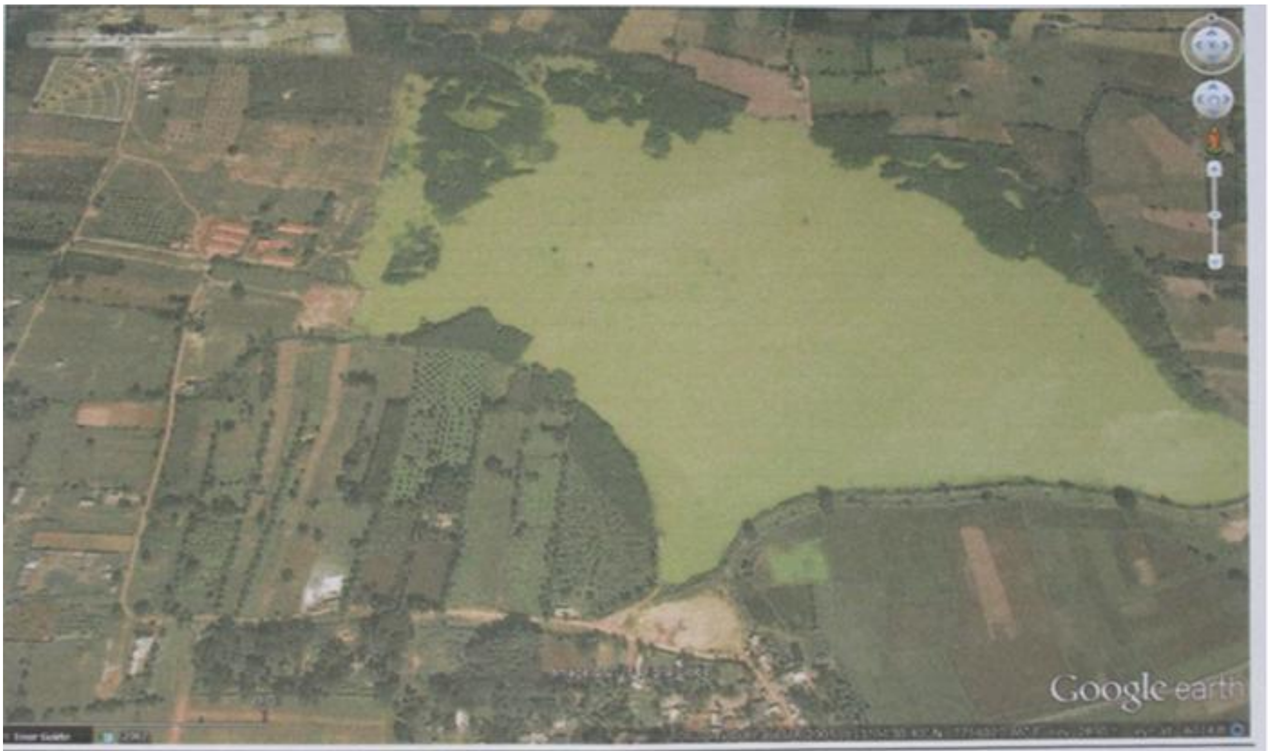
Pre summer fall

Summer heat

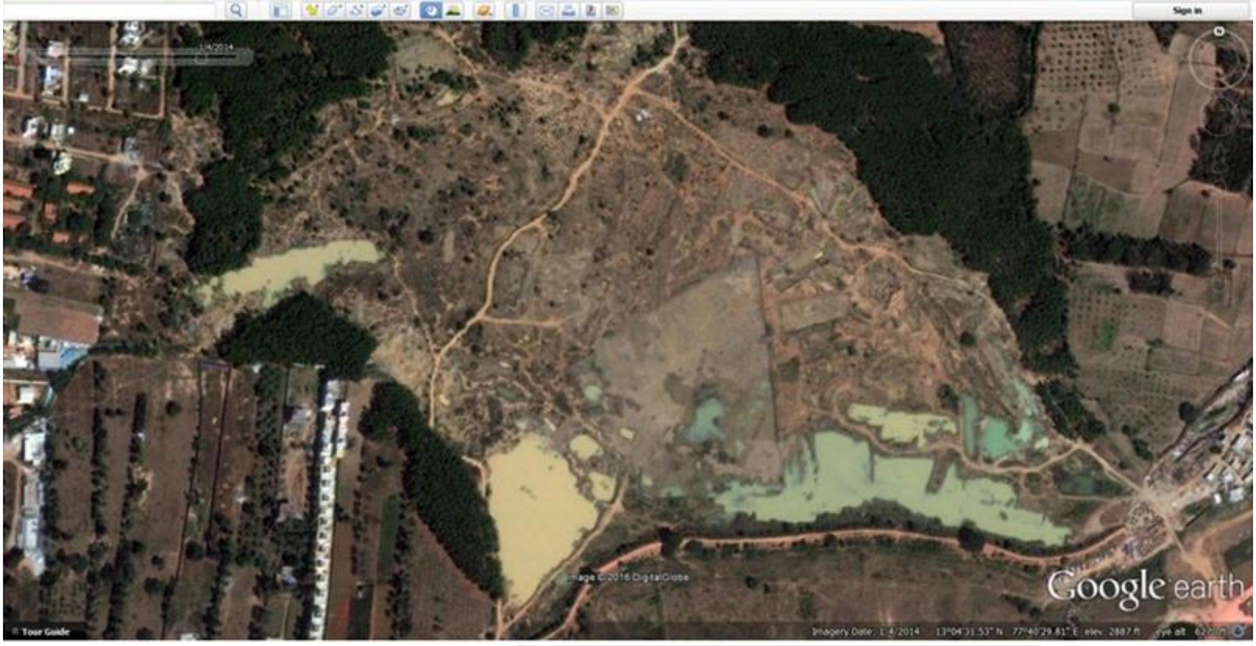
Monsoon rains

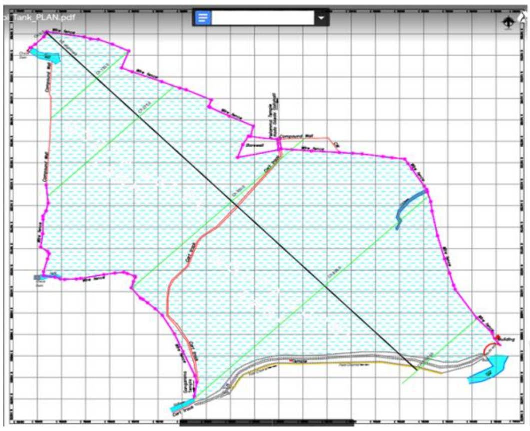
Each Seasons has its own diverse species of Plants, Insects, Animals and Birds.

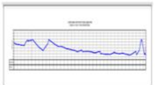
Doddagubbi Part-Lake Successful Revival as Case Study :

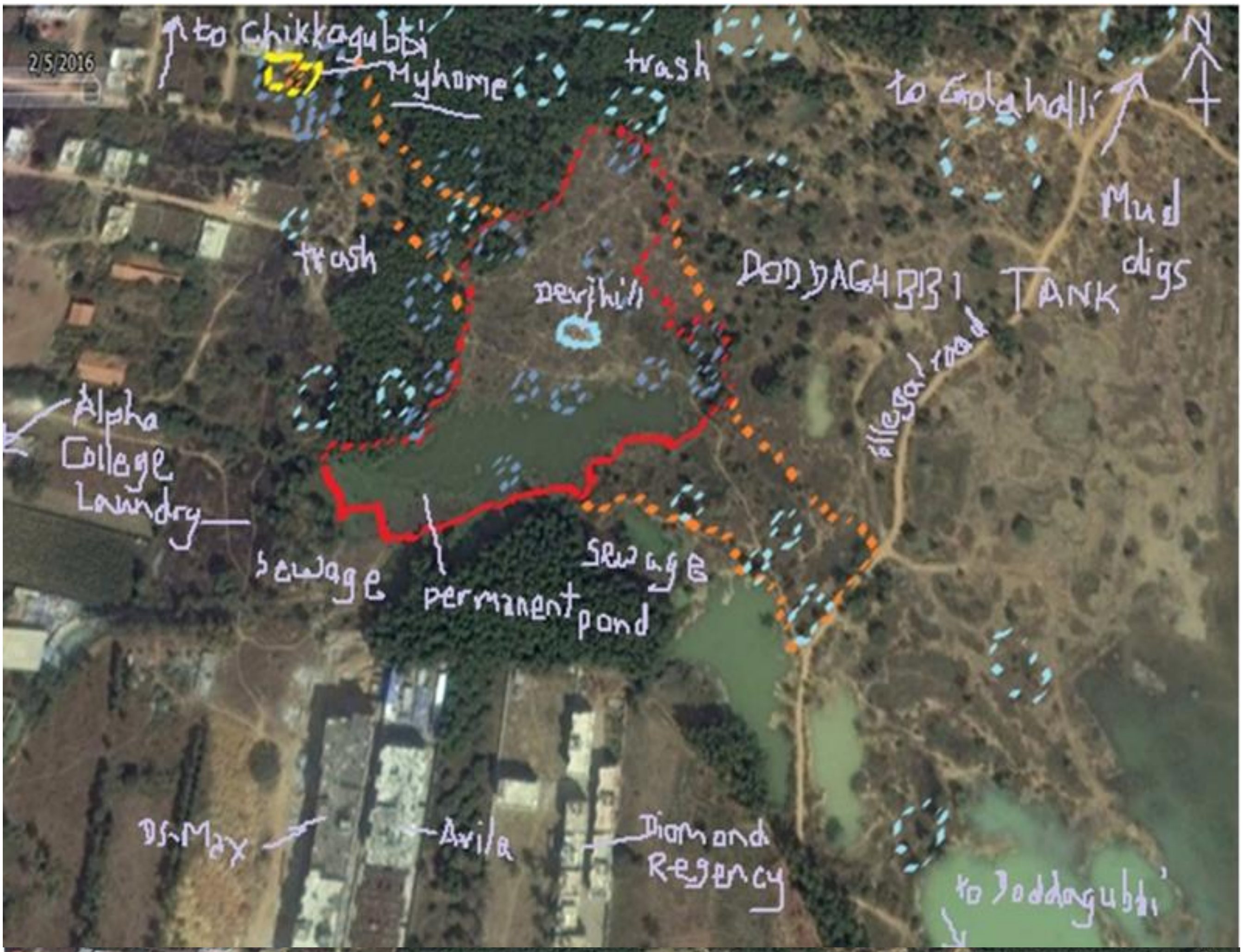

Google earth

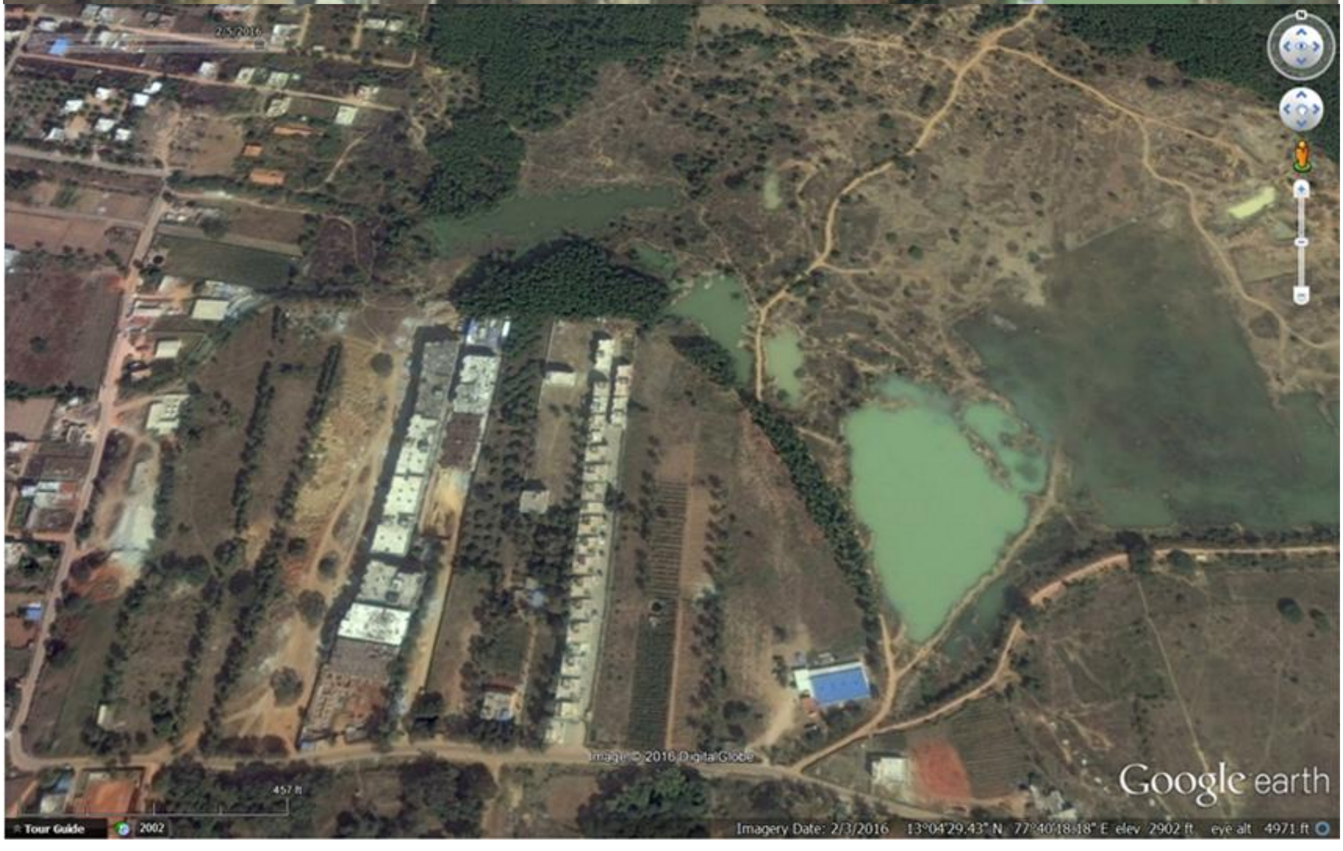
full and completely unpolluted **lake in 11-18-2005.** Note the colour of the lake


Sign in
1/4/2014
Image © 2016 DigitalGlobe
Google earth
Tour Guide
Imagery Date: 1/4/2014 13°04'31.53" N 77°40'29.81" E elev 2887 ft eye alt 62

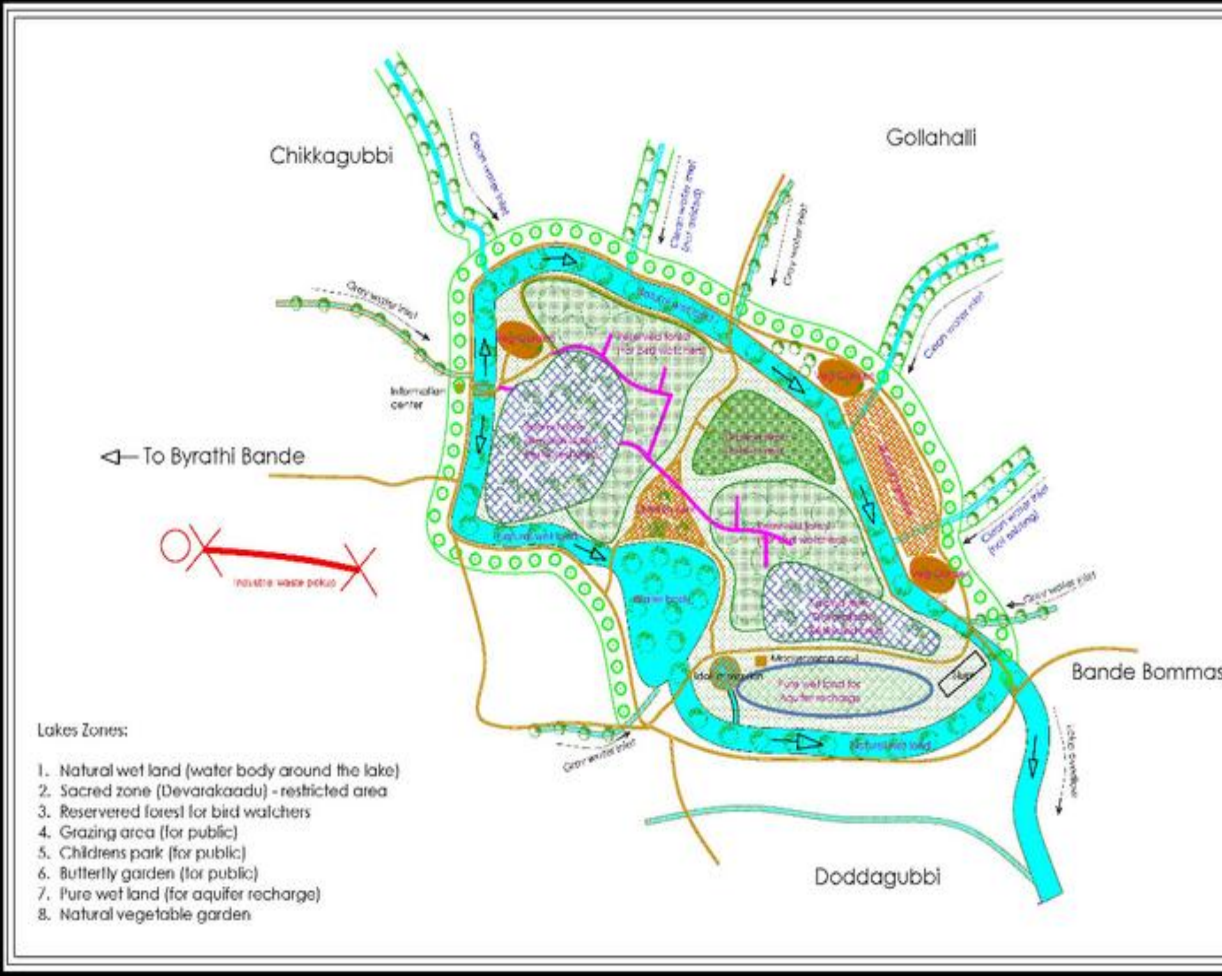

Tank_PLAN.pdf

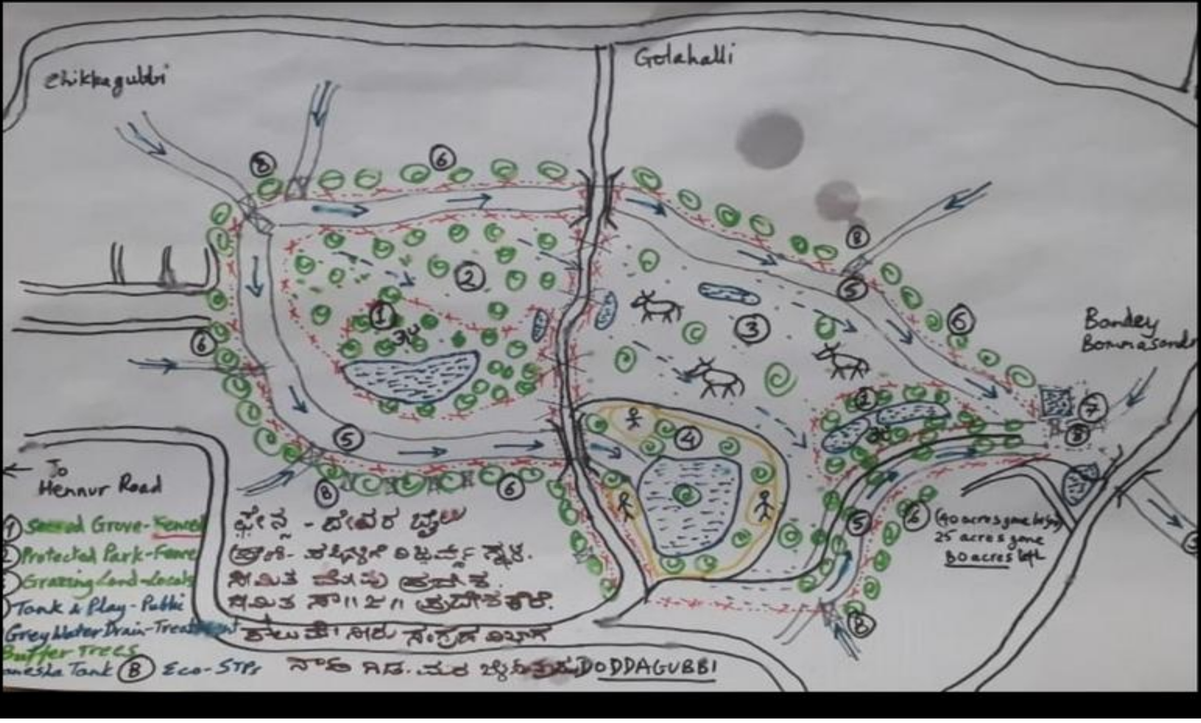


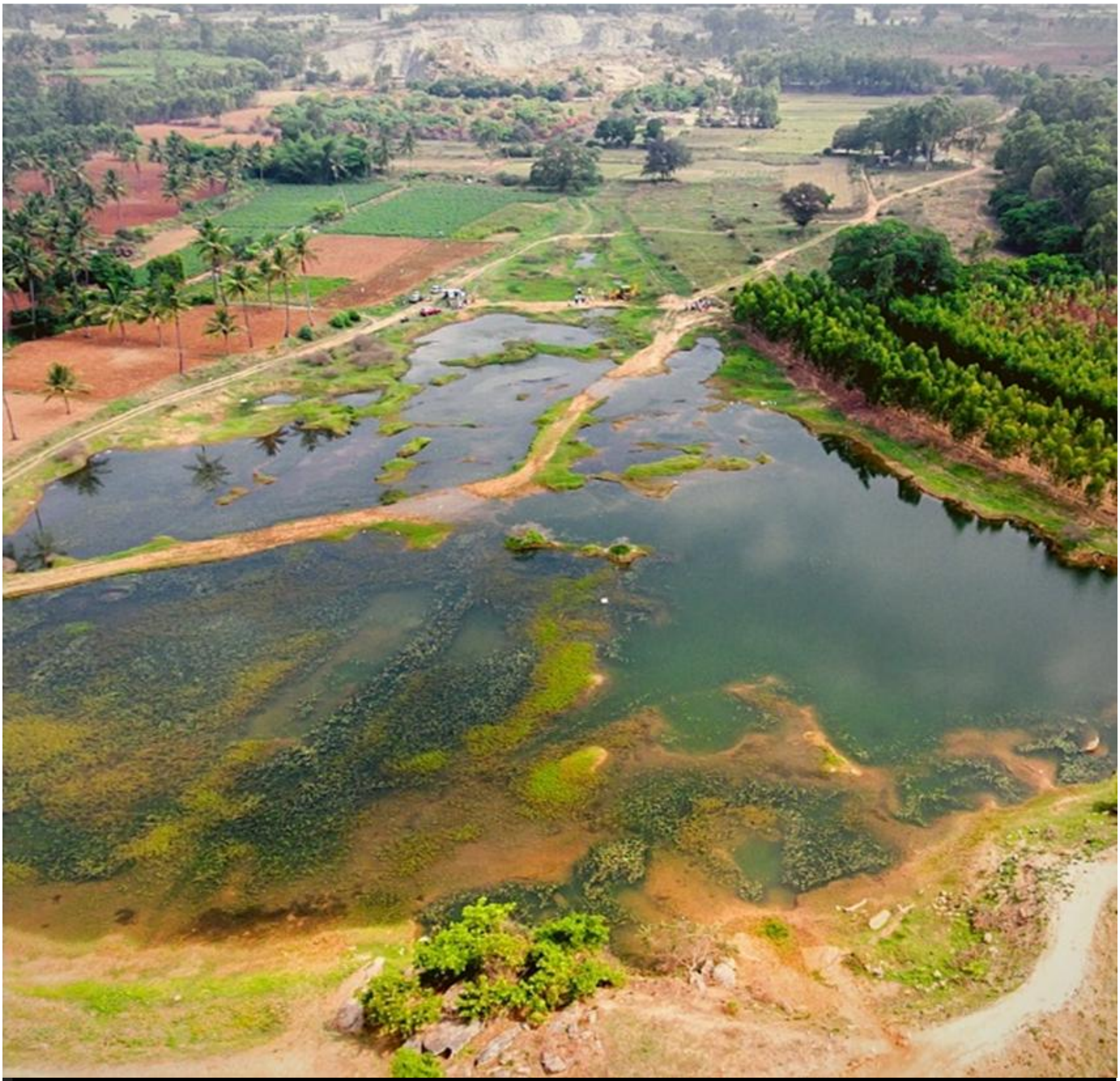

2/5/2016
to Chikkagubbi
Myhome
trash
to Golahalli
N
Mud digs
trash
Devi hill
DODDAGUBBI TANK
illegal road
Alpha College Laundry
sewage
permanent pond
sewage
Ds-Max
Avila
Diamond Regency
to Doddagubbi


2/5/2016
Image © 2016 DigitalGlobe
457 ft
Tour Guide
2002
Imagery Date: 2/3/2016 13°04'29.43" N 77°40'18.18" E elev 2902 ft eye alt 4971 ft
Google earth

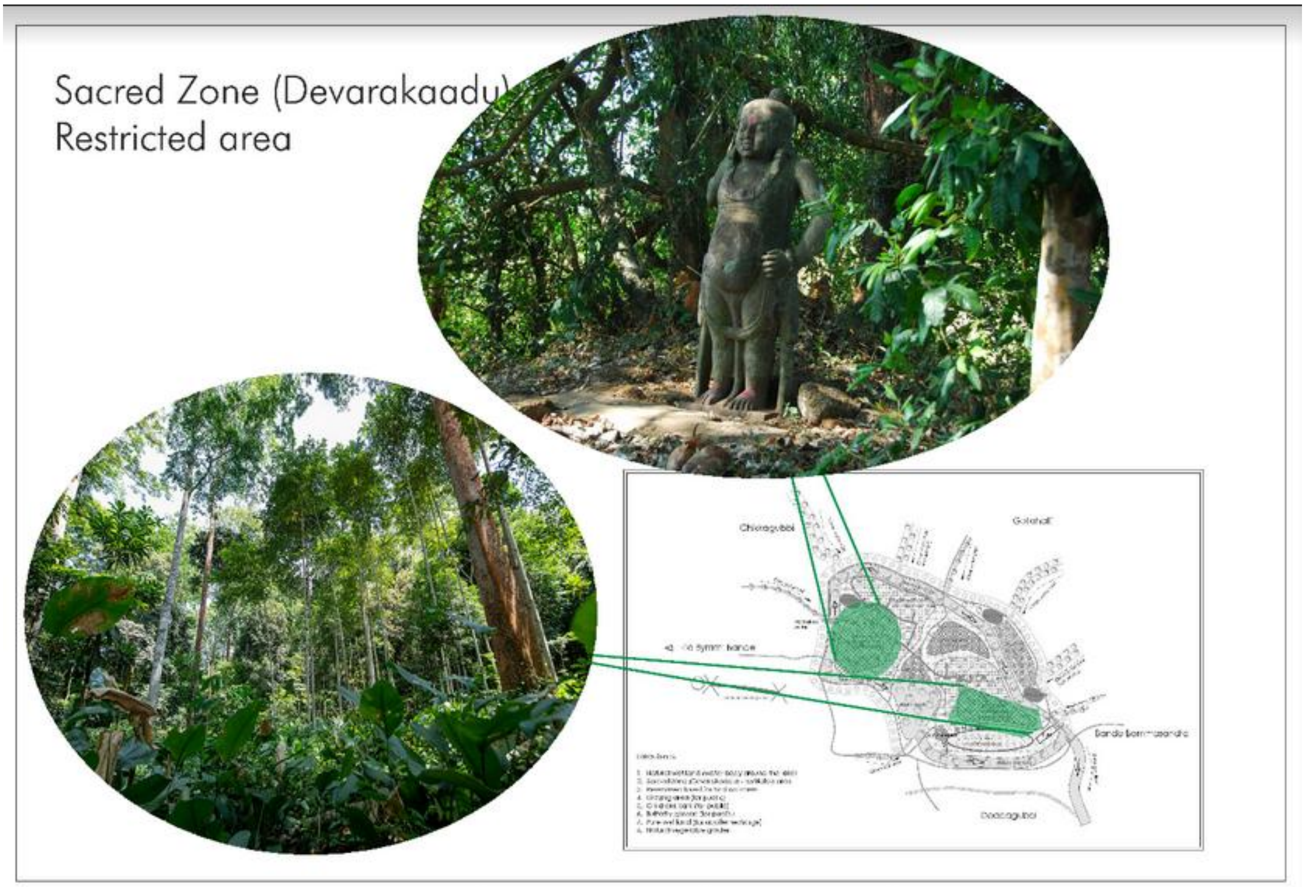
Proposed Lake plan for future rejuvenation


Chikkagubbi
Gollahalli
Clean water inlet
Grey water inlet
Information center
◁— To Byrathi Bande
Industrie waste polluo
Natural wet land
Bande Bommas
Grey water inlet
Clean water inlet
Doddagubbi
Lakes Zones:
1. Natural wet land (water body around the lake)
2. Sacred zone (Devarakaadu) - restricted area
3. Reservered forest for bird watchers
4. Grazing area (for public)
5. Childrens park (for public)
6. Butterfly garden (for public)
7. Pure wet land (for aquifer recharge)
8. Natural vegetable garden

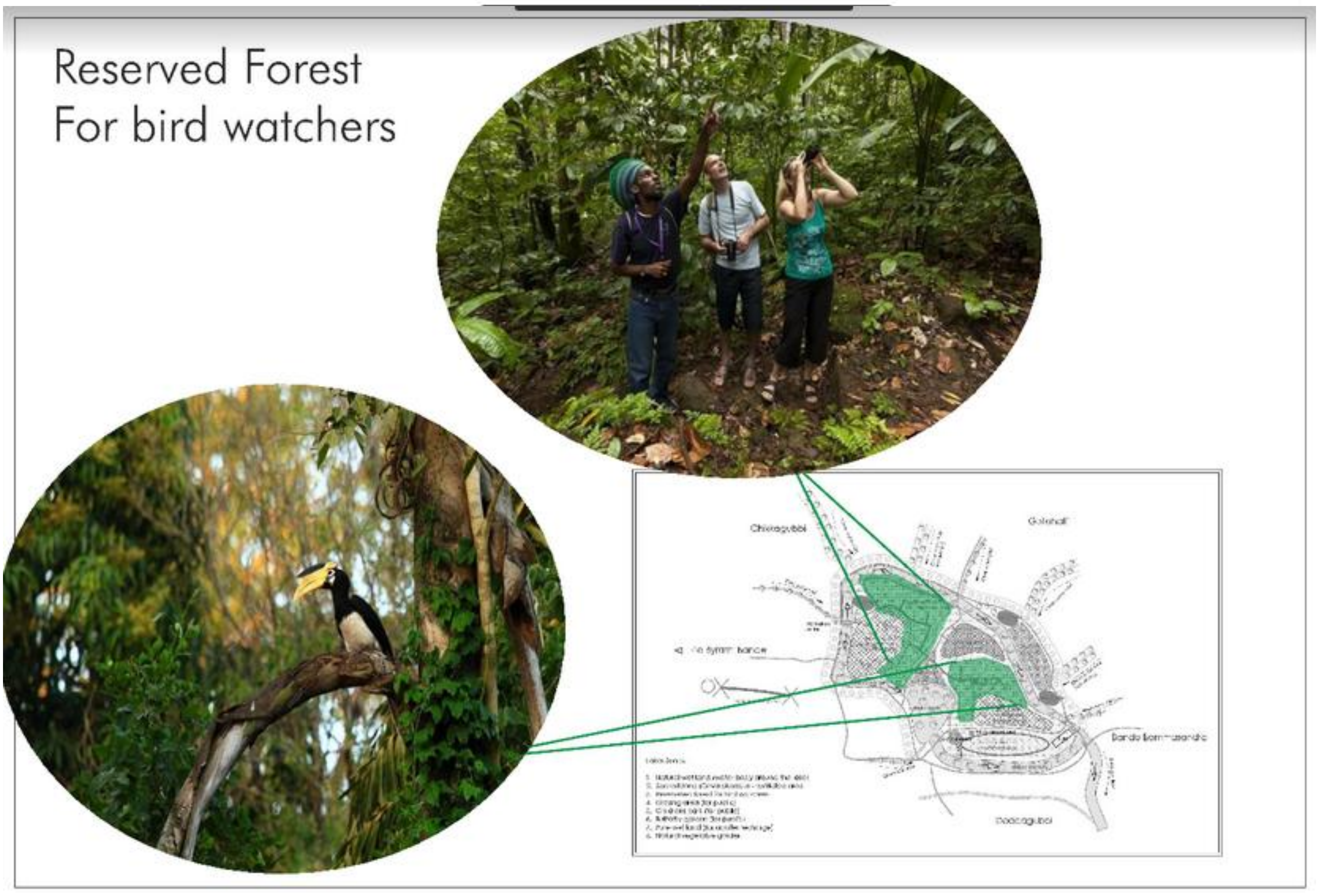

Chikkagubbi
Golahalli
Bandey Bommasandr
To Hennur Road
① Sacred Grove- Fenced
② Protected Park-Fence
③ Grazing Land-Locals
④ Tank & Play- Public
⑤ Grey Water Drain-Treatment
⑥ Buffer Trees
nesha Tank ⑧ Eco-STPs
(40 acres gone before)
25 acres gone
80 acres left
DODDAGUBBI



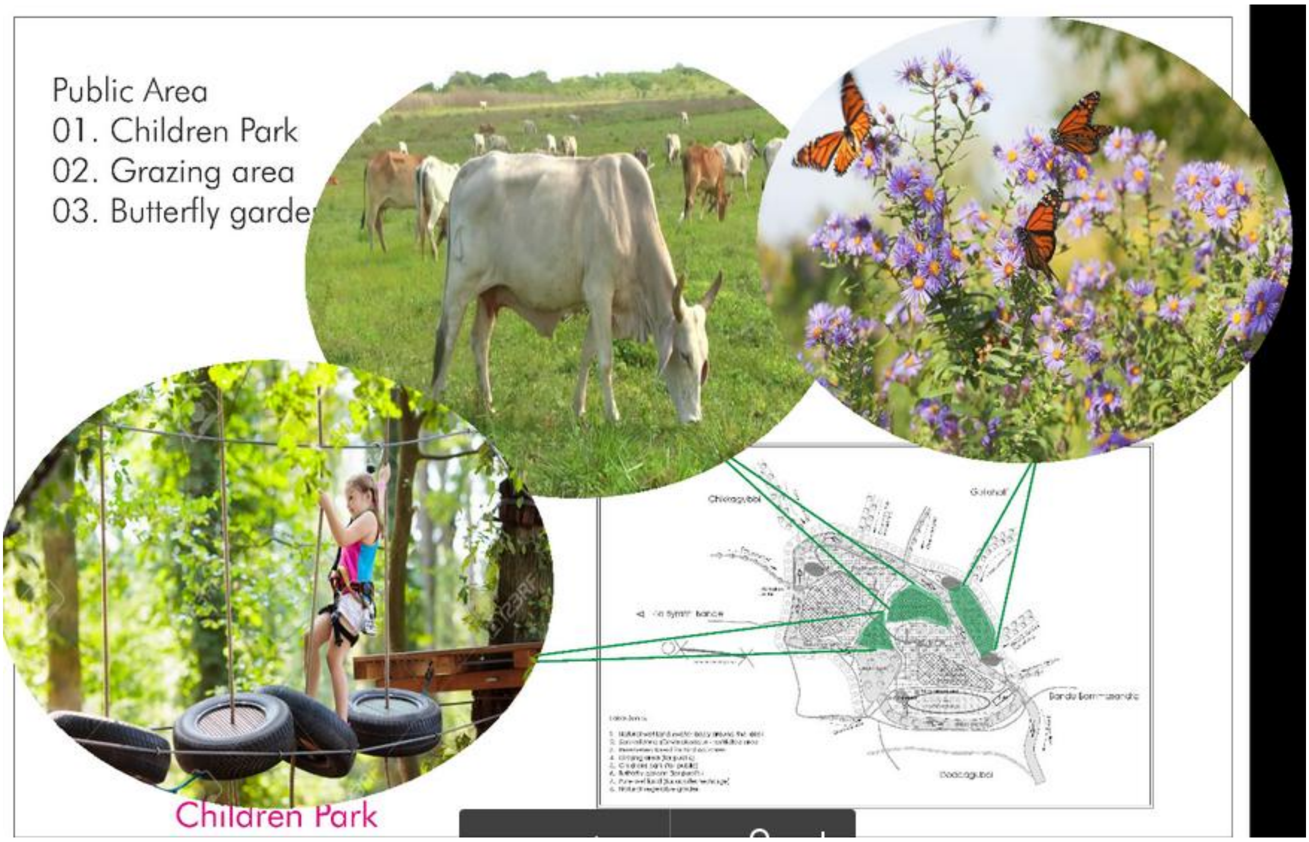
Lake Zones



Sacred Zone (Devarakaadu)
Restricted area



Reserved Forest
For bird watchers



Public Area

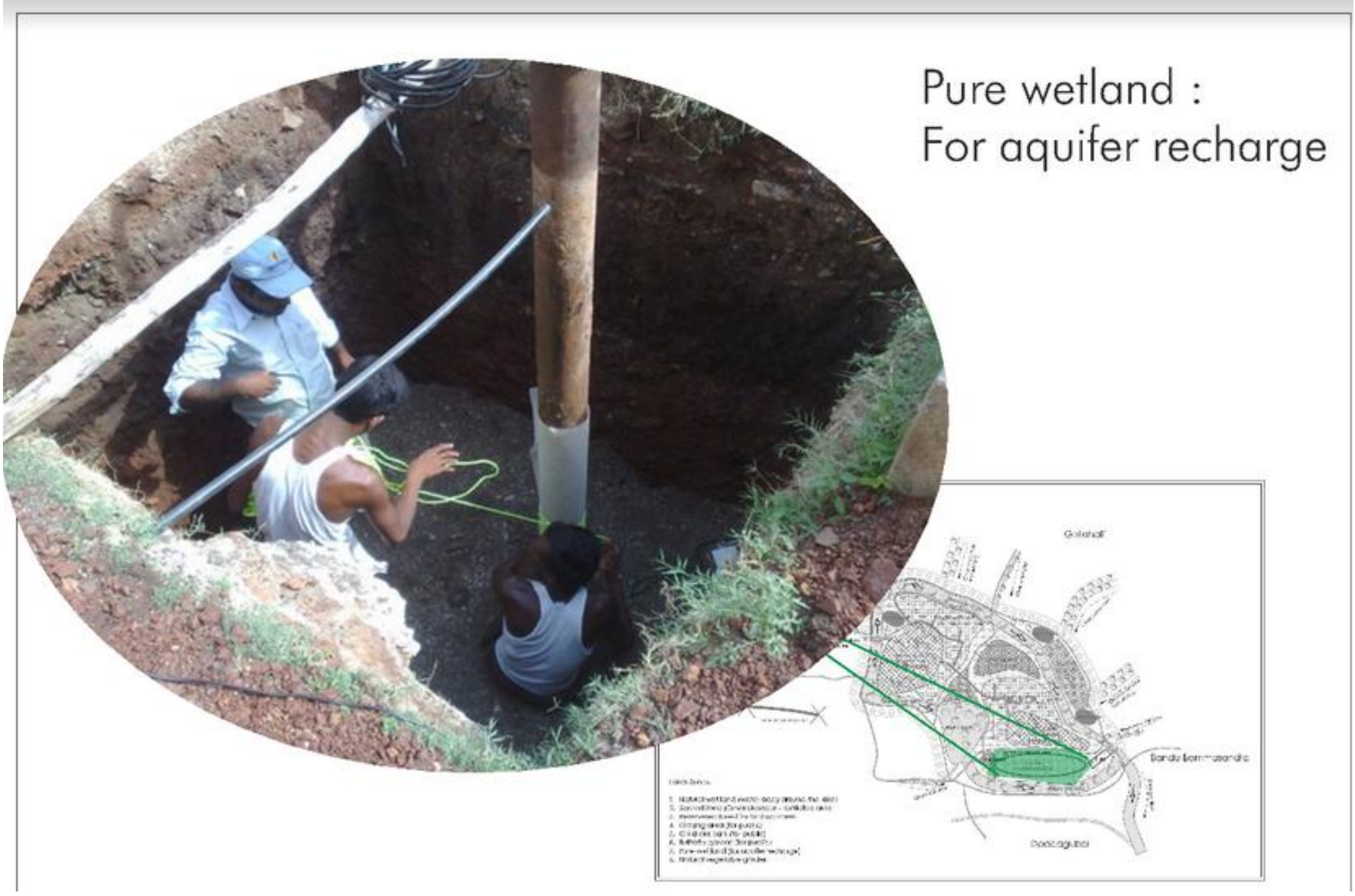
01. Children Park

02. Grazing area

03. Butterfly garde

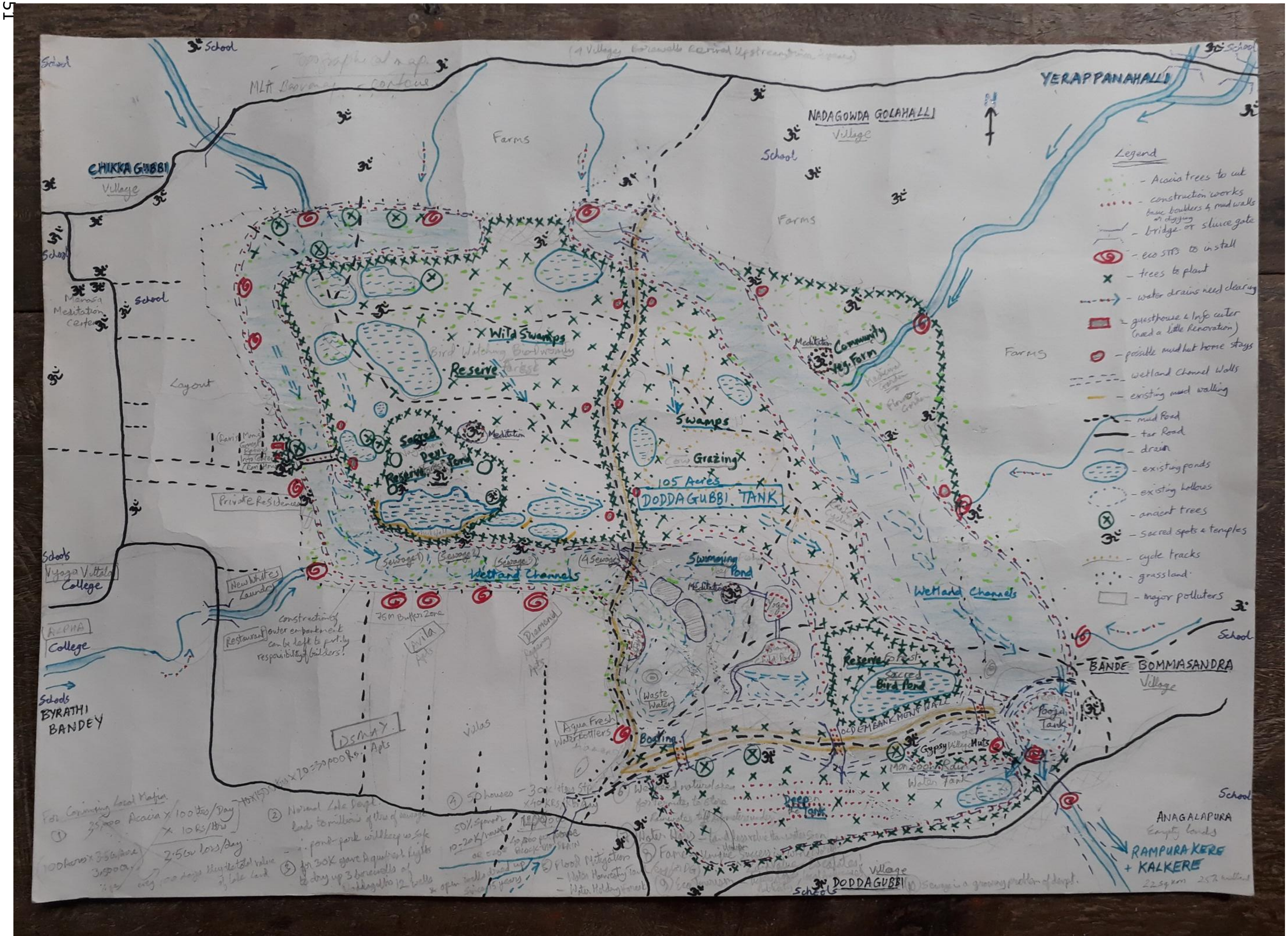
Children Park

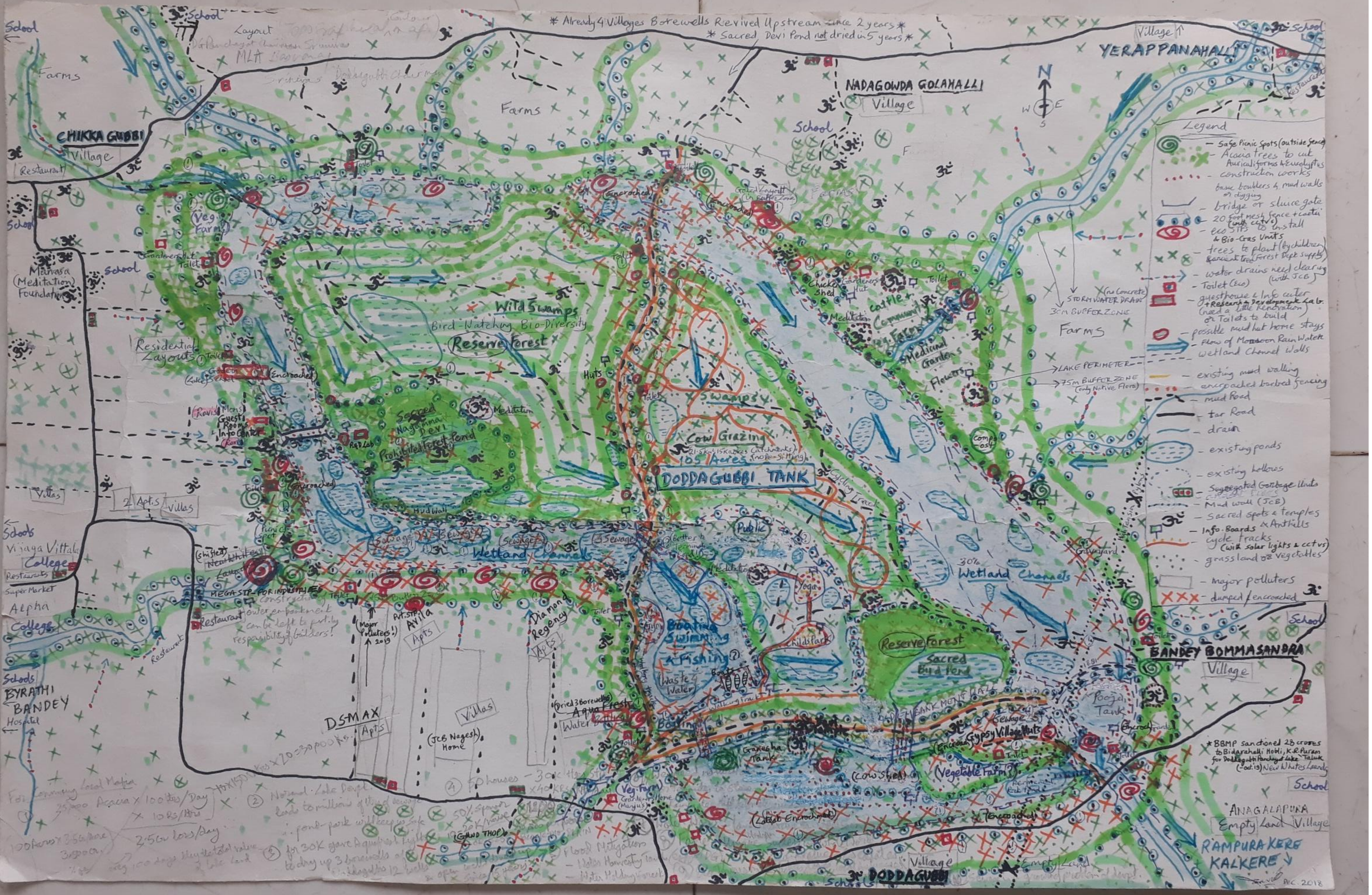
Chikkagubbi
Gollahalli
Bande Bommasandra
Doddagubbi



Pure wetland :
For aquifer recharge

Gollahalli
Bande Bommasandra
Doddagubbi


YERAPPANAHALLI
NADAGOWDA GOLAHALLI
Village
School
Farms
CHIKKA GUBBI
Village
School
Manasa Meditation Center
Layout
Wild Swamps
Bird Watching Biodiversity
Reserve
Sacred Devi Pond
Reserve
Meditation
Community Veg. Farm
Swamps
Cow Grazing
105 Acres
DODDAGUBBI TANK
Swimming Pond
Wetland Channels
Private Residence
New Whites Laundry
Restaurant
Constructing lower embankment can be left to partly responsibility of builders?
75M Buffer Zone
Avila Apts
Diamond Apts
DSMAX Apts
Villas
Aqua Fresh Water bottlers
Boating
Waste Water
Reserve Forest
Sacred Bird Pond
OLD EMBANKMENT WALL
Gypsy Village Huts
Monsoon Rain Water Tank
Deep Tank
Pooja Tank
BANDE BOMMASANDRA
Village
ANAGALAPURA
Empty lands
RAMPURA KERE + KALKERE
DODDAGUBBI
Village
Schools
Vijaya Vittala College
ALPHA College
Schools
BYRATHI BANDEY
Legend
- Acacia trees to cut
- construction works basic boulders & mud walls or digging
- bridge or sluice gate
- eco STPs to install
- trees to plant
- water drains need clearing
- guesthouse & Info center (need a little Renovation)
- possible mud hut home stays
wetland Channel Walls
- existing mud walling
- mud Road
- tar Road
- drain
- existing ponds
- existing hollows
- ancient trees
- sacred spots & temples
- cycle tracks
- grassland
- major polluters
For Convincing Local Mafia
① 35,000 Acacia x 100 tree/Day x 10 Rs/tree
2.5 Cr loss/day
② Normal Lake Sewage leads to millions of litres of sewage
③ for 30K gave Aquafresh rights to dry up 3 borewells of Doddagubbi to 12 wells
④ 50 houses - 30K Hay Stp x 40 KRs
50% Spons 10-20K/house
⑤ Flood Mitigation
- Water Harvesting Tank
- Water Holding Forest
⑩ Sewage is a growing problem of Bengl.


* Already 4 Villages Borewells Revived Upstream since 2 years *
* Sacred Devi Pond not dried in 5 years *
YERAPPANAHALLI
Village
NADAGOWDA GOLAHALLI
Village
CHIKKA GUBBI
Village
School
Farms
Restaurant
Manasa (Meditation) Foundation
Residential Layouts
Veg. Farm
Wild Swamps
Bird-Watching Bio-Diversity
Reserve Forest
Sacred Nagamma Devi Prohibited Forest Pond
Meditation
R&D Lab
Guest Rooms Info Center
Mud Wall
Wetland Channels
Sewage
MEGA STP FOR INDUSTRIES
Constructing outer embankment can be left to partly responsibility of builders!
DODDAGUBBI TANK
105 Acres
Cow Grazing
Swamps
Huts
Toilet
Cycling Track
Public
Yoga
Meditation
Child's Park
Boating Swimming
Fishing
Waste Water
Boats
Reserve Forest
Sacred Bird Pond
30% Wetland Channels
Medicinal Gardens
Flowers
Compost
Cattle + Community Farm
Chicken Shed
Gardener's Hut
N
W
E
S
STORM WATER DRAIN
X (no Concrete)
30m BUFFER ZONE
Farms
LAKE PERIMETER
75m BUFFER ZONE (only Native Flora)
Legend
- Safe Picnic Spots (outside fence)
- Acacia trees to cut Auriculiformis & Eucalyptus
- construction works base boulders & mud walls or digging
- bridge or sluice gate
- 20 foot mesh fence + cactii (with cctvs)
- eco STPs to install & Bio-Gas Units
- trees to plant (by children) & ancient tree (Forest Dept supply)
- water drains need clearing (with JCB)
- Toilet (Eco)
- guesthouse & Info center + Research & Development Lab (need a little Renovation) or Toilets to build
- possible mud hut home stays
- Flow of Monsoon Rain Water
- wetland Channel Walls
- existing mud walling
- encroached barbed fencing
- mud Road
- tar Road
- drain
- existing ponds
- existing hollows
- Segregated Garbage Units
- Mud wall (JCB)
- Sacred spots & temples & Anthills
- Info. Boards
- cycle tracks (with solar lights & cctvs)
- grassland or vegetables
- major polluters
- dumped / encroached
Graveyard
High Tension
BANDEY BOMMASANDRA
Village
Pooja Tank
Gypsy Village Huts
Vegetable Farm
Cow Shed
Ganesha Tank
Veg. Farm
Gardener's Home (Manju's)
(Encroached)
(Latest Encroached)
* BBMP sanctioned 28 crores to Bidarahalli Hobli, K.R. Puram for Doddagubbi Panchayat Lake Taluk (Oct. 19) New Whites Land
School
ANAGALAPURA
Empty Land Village
RAMPURA KERE
KALKERE
DODDAGUBBI
Village
Flood Mitigation
- Water Harvesting
- Water Holding Forest
(Dried 3 Borewells) Aqua Fresh Water Bottling
Diamond Regency Apts
Avila Apts
Major Polluters! 2019
DSMAX Apts
Villas
(JCB Nagesh) Home
(GRAND THOP)
50% Sponsor
(4) 50 houses
(2) Natural Lake Devpt leads to millions of litres of sewage
pond-park will keep us safe
(3) for 30K gave Aquafresh rights to dry up 3 borewells
For Conning Local Mafia
(1) 35000 Acacia x 100 Rs/Day
x 10 Rs/Hr
2.5 Cr Loss/day
100 Acres x 3.5 Cr/Acre
3,500 Cr
BYRATHI BANDEY
Hospital
Schools
College
Vijaya Vittala
Restaurants
Super Market
Alpha
Villas
2 Apts
Layout
MLA
RVC 2018

Aspects to cover in Design Plan for Lake Revival pilot Model on Doddagubbi Tank:

A- Motored Roads--

1- roads shud not ring the lake completely.. some areas shud be inaccessible
2- all roads to have 20 foot wire fencing - good visiblity but
discouraging trash
3- fencing to be electrified at night ? to dissuade entry to restricted areas
4- dummy cctv spy cameras to be installed with boards all around

5- distant points.. away from -6- for nice lookout points to enjoy lake scenes
6- designated picnic spots for sitting, drinking, bonfires.. all
outside 20' fence
7- information boards put up to make public aware about lake, nature, life..

B- Apartments & Residential Layouts--

8- each apartment complex, residential layout, other large institution around the lake to have a designated lake warden committee with a spokesperson
9- all lake warden committees to update observations on a blog every 2 weeks
- health of lake by measuring the aquatic flora and fauna condition
- Biological oxygen demand (BOD) of the lake
- pollution level in the lake with pollution control board
10- each spokesperson from lake committees to attend a meeting every 3 months

11- every apartment/layout to have their own bio eco sewage treatment at outlet
12- each to collect and send kitchen waste daily for composting to lake garden
13- each to have a separate free dry eco toilet units
14- each to have their own garbage segregation unit on road
15- complexes permitted to have borewells must also provide free drinking water

C- Designated Celebrations/Festivals Area--

16- raised area with amphitheater and pond for poojas, music fests, immersion..
17- pond will have an outlet system for overflow to treatment & clay collection
18- clay to be partially dried and re used for pottery or art workshops
19- designated segregated garbage collection unit
20- designated dry toilets
21- adjacent park area including exercise equipments and huts
22- all of this separated from lake with 20 foot fencing
23- plastic free zone [watchmen / boards / pickers ..]

D- Information Center--

24- staffed building at main gate with mini library and exhibition of photos
[possible guided tours and students weekly workshop activities, blog updating]
25- all Entry Gates to have a security guard & lockers for not permitted items
[no plastics, snacks, other disposable items allowed in lake premises]
26- 2 rooms for scientists, researchers, naturalists and other special guests

E- Buffer Zones--

27- clear invasive foreign trees - auriculiformis, eucalyptus, teak,
silver, fir..
28- where available around the lake perimeter - afforest miyazaki style
29- also where possible separate the open sewage treatment channels
from the main park-ponds areas with another buffer zone of miyazaki forest

F- Open to air Organic Waste Water Treatment Drains--

30- drain water to be channeled around the main lake-park area, well separated
31- higher walls should provision for overload of inflow during rains
32- stone walling used only on the outer side of drain, mud on lake side
33- cloth washing area provided in convenient locations [so flow enters drains]

G- Commons Lake-Park -Swimming,Fishing,Boating,Gardening,Grazing,Cycling--

34- cow grazers permitted to enter [sheep n goats not allowed]
35- firewood collection [only by poor locals] permitted
36- basic fishing and hunting allowed? [without nets, traps, weapons]
[they should not introduce any exotic/ foreign fish into the lake]

37- staff maintained beautiful flower garden perennially full of blossoms
38- educated staff maintained medicinal n aromatic plants garden [with guides]
39- nursery for exploration and propagation of native species to public
40- community farming area for organic vegetables [1 acre per village?]
after distributing the produce to locals.. if extra.. also start
community kitchen
[with training in preservation of local native healthy cooking recipes]
if there is still excess of veggies put in organic shop at reasonable rates
bio-gas unit for processing and composting the collective kitchen wastes

41- some open huts and look out posts and painting/playing areas
42- isolated/ hidden small mud huts for reasonable short family stays
43- gypsies permitted to build temporary huts and grow greens/fish [no vehicles]
44- meditation space.. open to elements.. light roofing [transparent]

45- walking/cycling paths meander through the park area [cycles only on path]
46- sculptures and installations and mazes designed into the park area
47- childrens play and get dirty area.. near to the farming area
48- swimming pond for bathing and boating [open to all public]

H- Reserved Forest Ponds Park--

49- only for Permitted naturalists,wetlanders,birdwatchers,wildlife photographer
50- wild animal rehabilitation zone
51- strategic unobtrusive bird watching machans erected n camouflauged
52- only small footpaths [no vehicles, no digressing off the paths]
53- no plucking flowers, no picking up sticks, no throwing anything, etc
54- silent zone, no lights, no cell phones, no loud talking..

I- Sacred Space with Open Shrine--

55- preferably near some old trees
56- a simple stone effigy
57- prayer and simple offerings of flowers allowed [nothing more]
58- entry only for a few people at a time.. locals and sanctuary caretakers only
59- all original local mini shrines around lake to be protected respectfully
60- no talking at all only [sign language] very cautious loving respectful entry

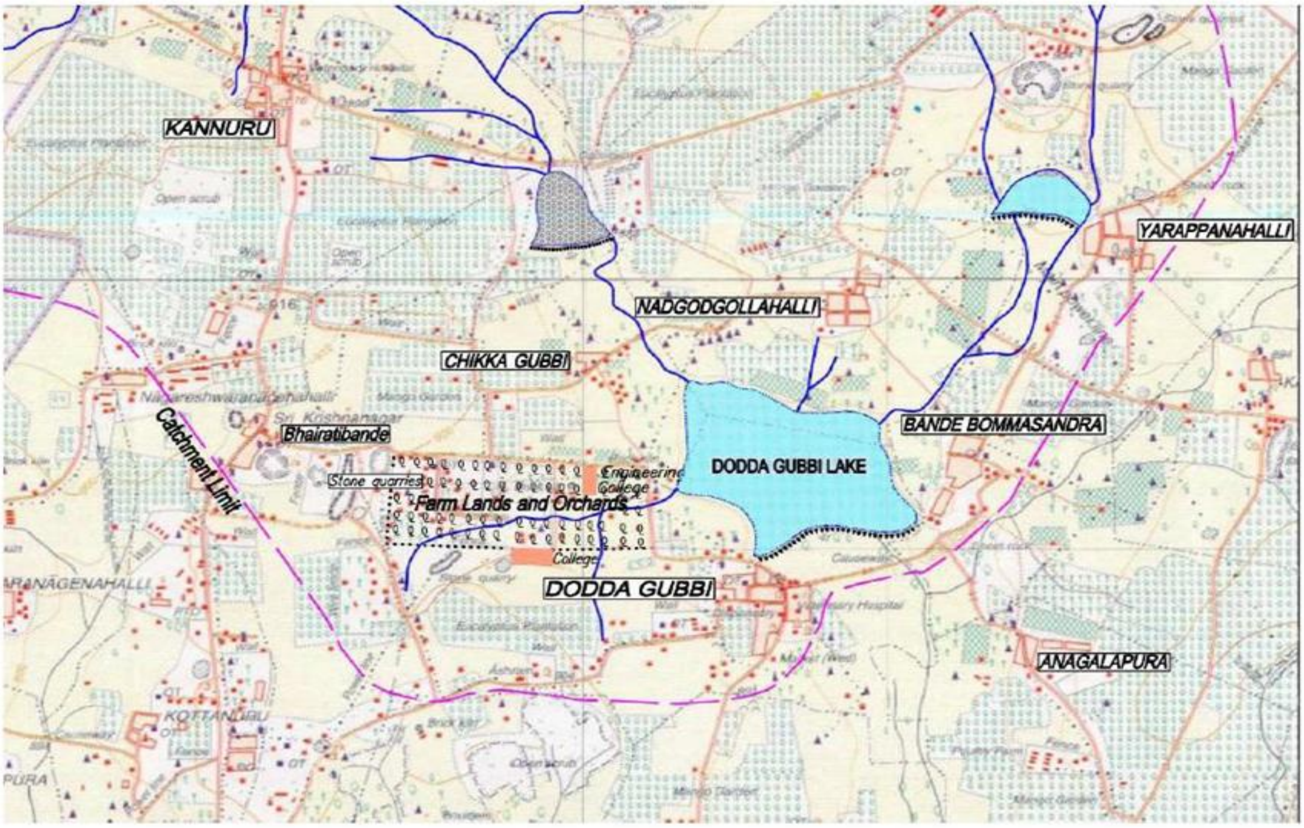
J- Additionally--

61- serious treatment units for strong chemicals in designated industrial areeas
62- collective dry waste segregation center
63- collective waste recycle unit?

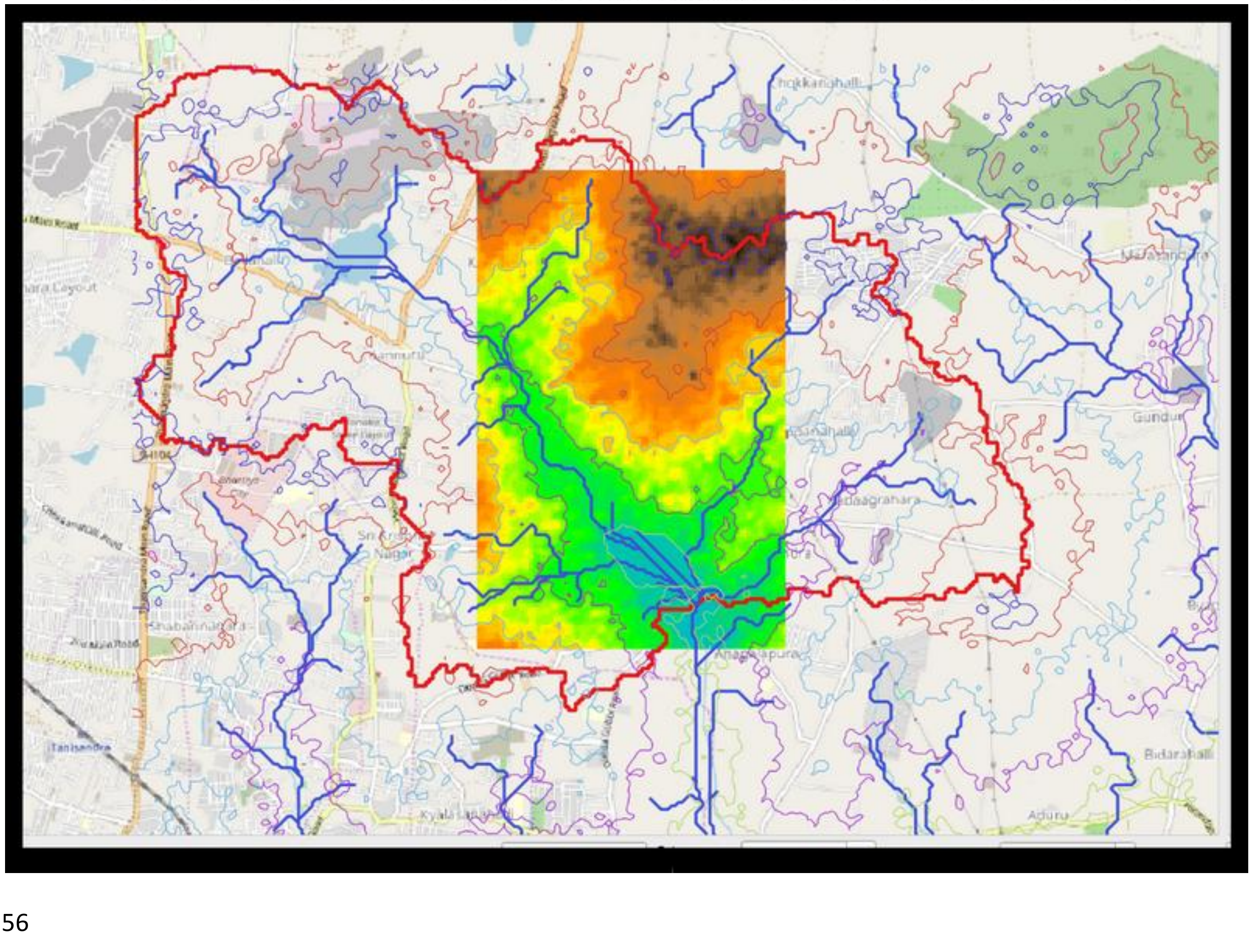
64- lake wardens homes in buffer zone? [me!]

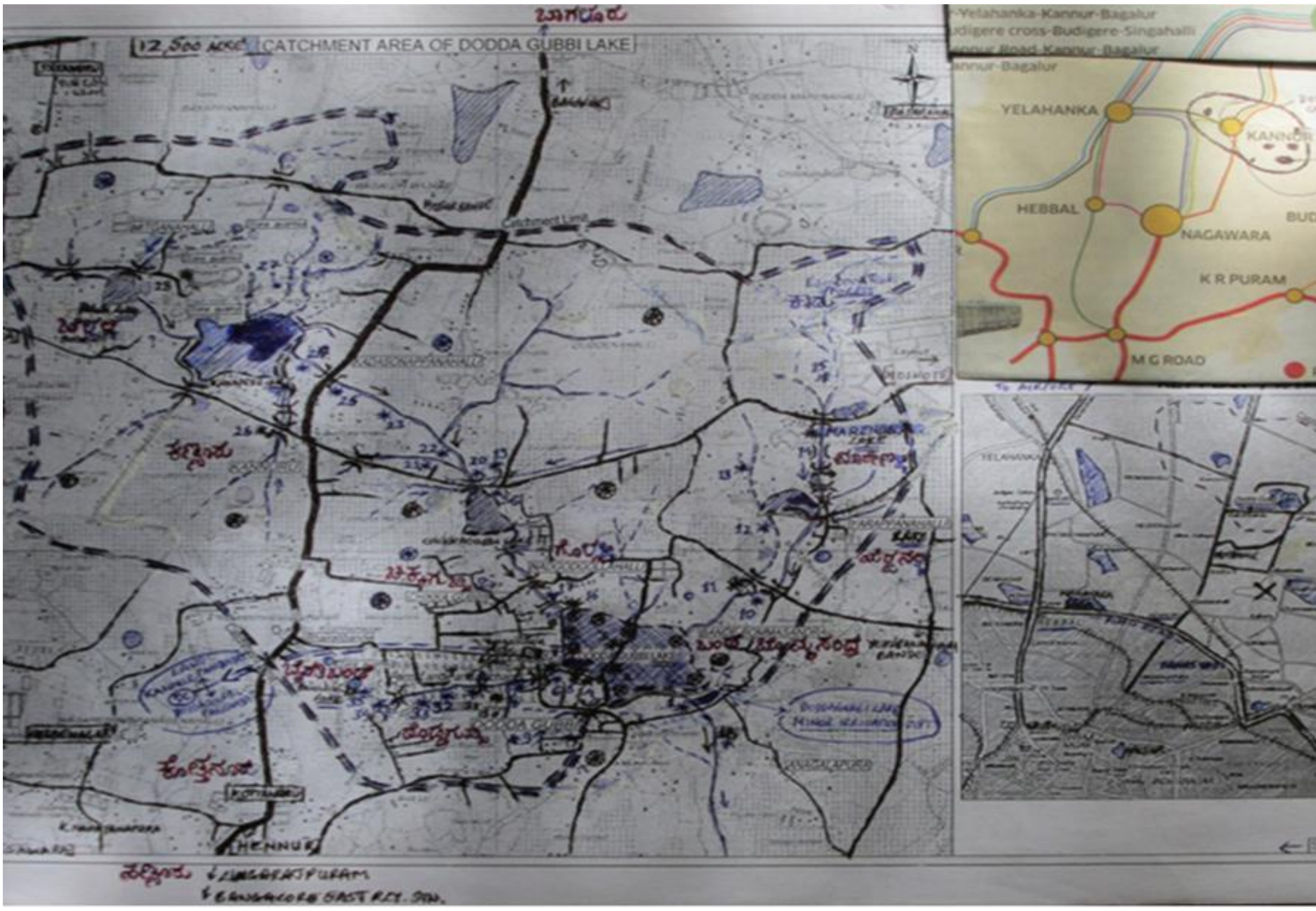
65- inside lake borewells to supply local villages?
66- downstream end of the tank to include a surplus monsoon water holding tank

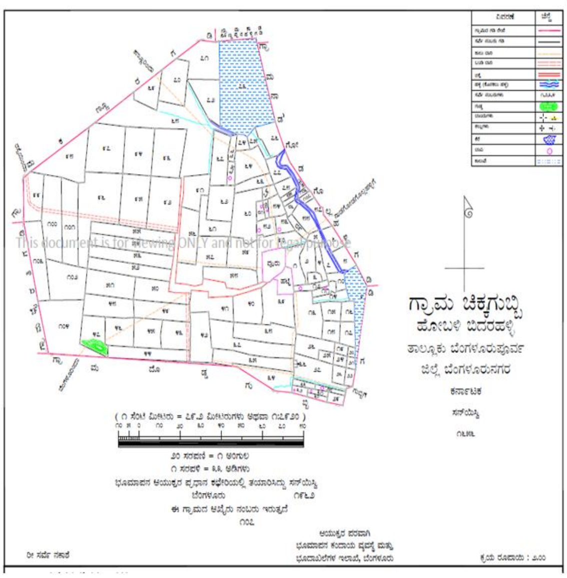
67- excessive mud not used in gardens to be sold to local constructions


KANNURU
NADGODGOLLAHALLI
YARAPPANAHALLI
CHIKKA GUBBI
Sri Krishnanagar
Bhairatibande
Catchment Limit
BANDE BOMMASANDRA
Stone quarries
Farm Lands and Orchards
Engineering College
DODDA GUBBI LAKE
College
DODDA GUBBI
ANAGALAPURA
KOTTANURU

Survey of India Map of the Doddagubbi Area showing Primary Raja Kaluves from Doddagubbi Lake




12,500 acre
CATCHMENT AREA OF DODDA GUBBI LAKE
Yelahanka-Kannur-Bagalur
Budigere cross-Budigere-Singahalli
Kannur Road Kannur-Bagalur
Kannur-Bagalur
YELAHANKA
KANNUR
HEBBAL
NAGAWARA
K R PURAM
M G ROAD
HENNUR
ಬಾಗಲೂರು
ಚಿಕ್ಕಗುಬ್ಬಿ
ದೊಡ್ಡಗುಬ್ಬಿ
ಕೊತ್ತನೂರು


ಗ್ರಾಮ ಚಿಕ್ಕಗುಬ್ಬಿ
ಹೋಬಳಿ ಬಿದರಹಳ್ಳಿ
ತಾಲ್ಲೂಕು ಬೆಂಗಳೂರುಪೂರ್ವ
ಜಿಲ್ಲೆ ಬೆಂಗಳೂರುನಗರ
ಕರ್ನಾಟಕ
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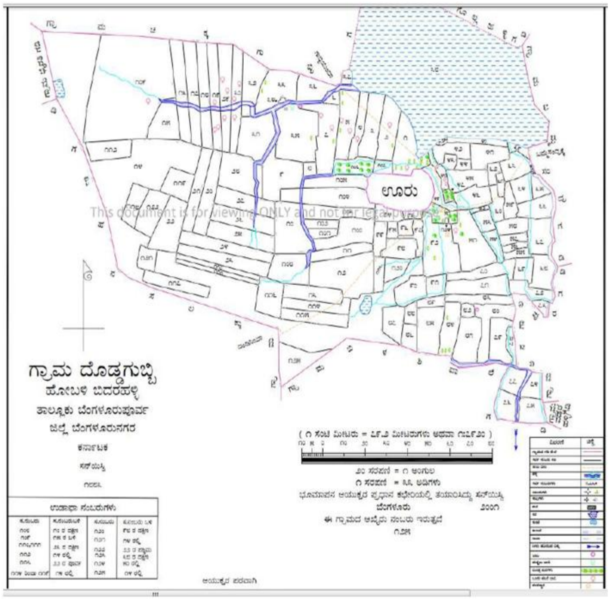
ಊರು
ಗ್ರಾಮ ದೊಡ್ಡಗುಬ್ಬಿ
ಹೋಬಳಿ ಬಿದರಹಳ್ಳಿ
ತಾಲ್ಲೂಕು ಬೆಂಗಳೂರುಪೂರ್ವ
ಜಿಲ್ಲೆ ಬೆಂಗಳೂರುನಗರ
ಕರ್ನಾಟಕ
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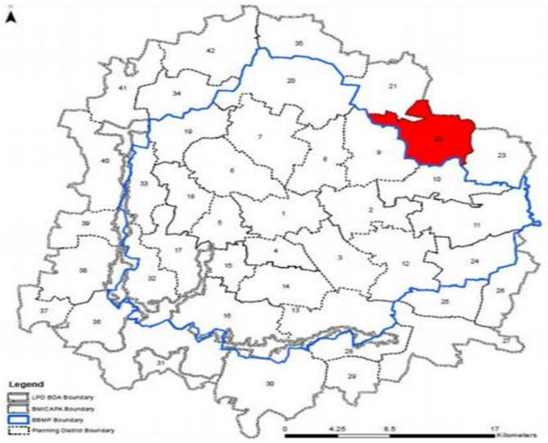
Chikkagubbi panchayat, marenahalli hobli

doddagubbi panchayat, bidarahalli hobli

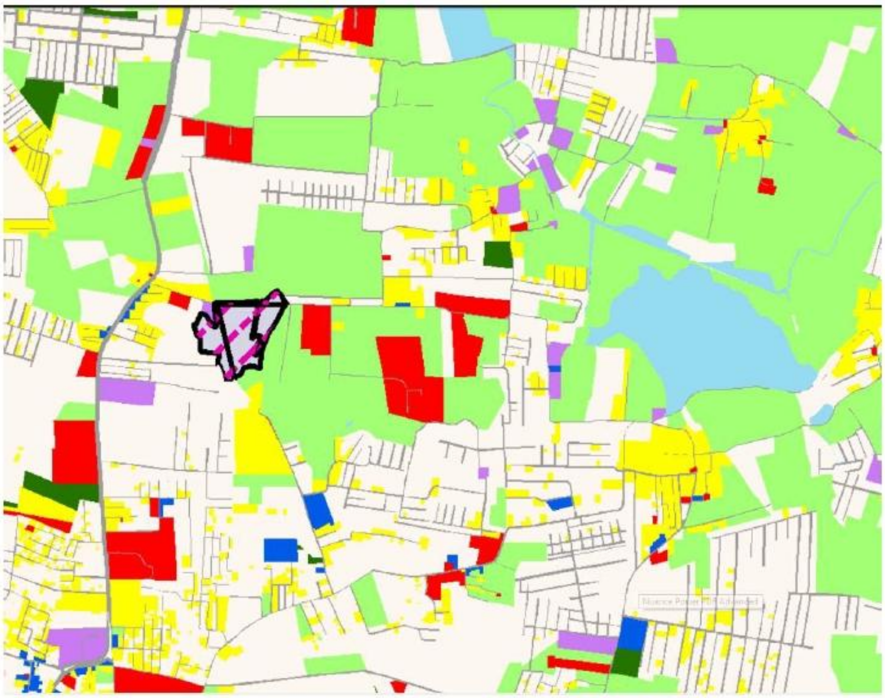

Legend
LPD BDA Boundary
BMICAPA Boundary
BBMP Boundary
Planning District Boundary
0
4.25
8.5
17
Kilometers

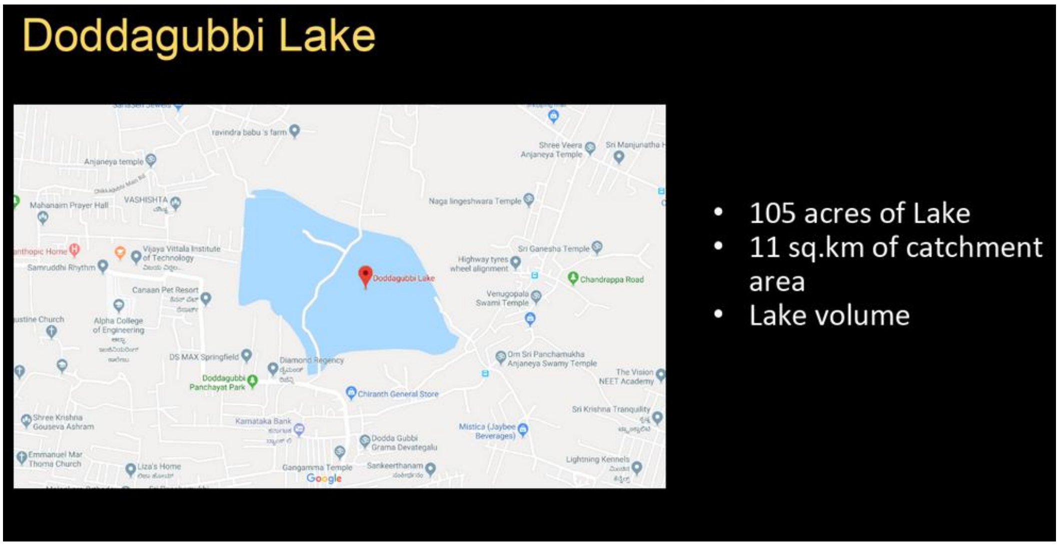
Population (2011 Census): 23,314
Area of PD: 3216.94 ha
Gramthana in PD: 13
Gross Density: 07 pph

Bidarahalli Planning District (PD 22) is located in the north-eastern side of BMA planning area between Dodda Gubbi Main Road and Old Madras Road. This PD shares boundary with tehHoskote LPA.

RMP 2031 proposes growth along the PRR and preservation of Agriculture Zone.

1. The PD falls completely within Bidarahalli Hobli. The PD comprises of 13 villages namely Kada Agrahara, Anagalapura, Byappanahalli, Vaddarahalli, Adooru, Bidarahalli, Ramapura, Huvina Ane, Maragondanahalli, Kithaganooru, Hale halli, Hirandahalli, Doddagubbi (Srigubbi).
2. Avalahalli Main Road and Kethigannur Main Road are the two main roads in the PD.

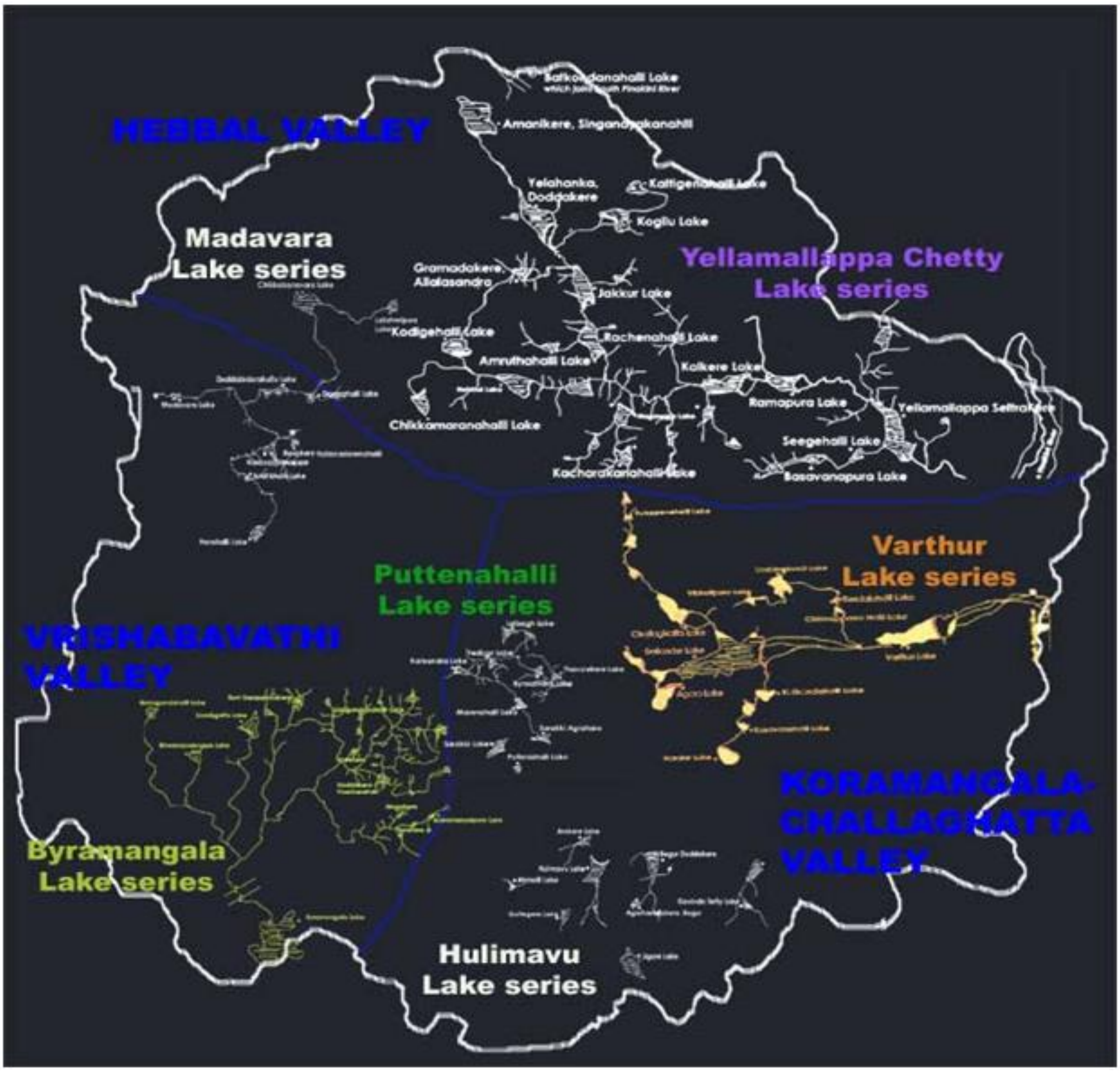




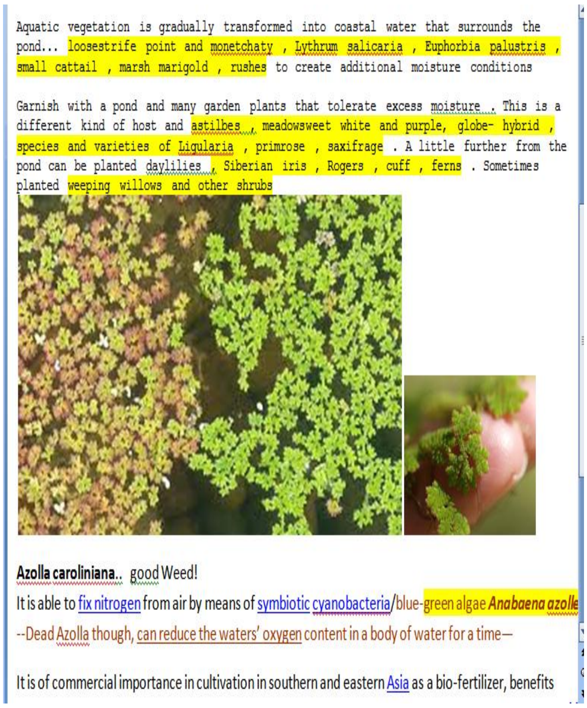
Doddagubbi Lake

ravindra babu 's farm
Anjaneya temple
Shree Veera Anjaneya Temple
Sri Manjunatha
Mahanaim Prayer Hall
VASHISHTA
Naga lingeshwara Temple
Samruddhi Rhythm
Vijaya Vittala Institute of Technology
Sri Ganesha Temple
Highway tyres wheel alignment
Doddagubbi Lake
Chandrappa Road
Canaan Pet Resort
Venugopala Swami Temple
Alpha College of Engineering
DS MAX Springfield
Diamond Regency
Om Sri Panchamukha Anjaneya Swamy Temple
Doddagubbi Panchayat Park
Chiranth General Store
The Vision NEET Academy
Shree Krishna Gouseva Ashram
Karnataka Bank
Mistica (Jaybee Beverages)
Sri Krishna Tranquility
Dodda Gubbi Grama Devategalu
Emmanuel Mar Thoma Church
Liza's Home
Gangamma Temple
Sankeerthanam
Lightning Kennels
Google

- 105 acres of Lake
- 11 sq.km of catchment area
- Lake volume


HEBBAL VALLEY
Satkondanahalli Lake which joins South Pinakini River
Amanikere, Singanayakanahalli
Yelahanka, Doddakere
Kattigenahalli Lake
Kogilu Lake
Madavara Lake series
Gramadakere, Allalasandra
Jakkur Lake
Yellamallappa Chetty Lake series
Kodigehalli Lake
Rachenahalli Lake
Amruthahalli Lake
Kalkere Lake
Ramapura Lake
Yellamallappa Settrakere
Chikkamaranahalli Lake
Seegehalli Lake
Kacharakanahalli Lake
Basavanapura Lake
Varthur Lake series
Puttenahalli Lake series
VRISHABAVATHI VALLEY
Agara Lake
KORAMANGALA-CHALLAGHATTA VALLEY
Byramangala Lake series
Hulimavu Lake series

BK Singh CEO, LDA with Z. Fatehally on the TankMr Zafar Futehally, was a noted environmentalist, ornithologist and Padmasri awardee was a residentof Doddagubbi and made numerous efforts to promote the birdlife of Doddagubbitankand organized regular visits by local amateurs, professionals and international ornithologists including Dr Dominique GHomberger, Secretary General, International Ornithological Congress (IOC)



Aquatic vegetation is gradually transformed into coastal water that surrounds the pond... loosestrife point and monetchaty , Lythrum salicaria , Euphorbia palustris , small cattail , marsh marigold , rushes to create additional moisture conditions

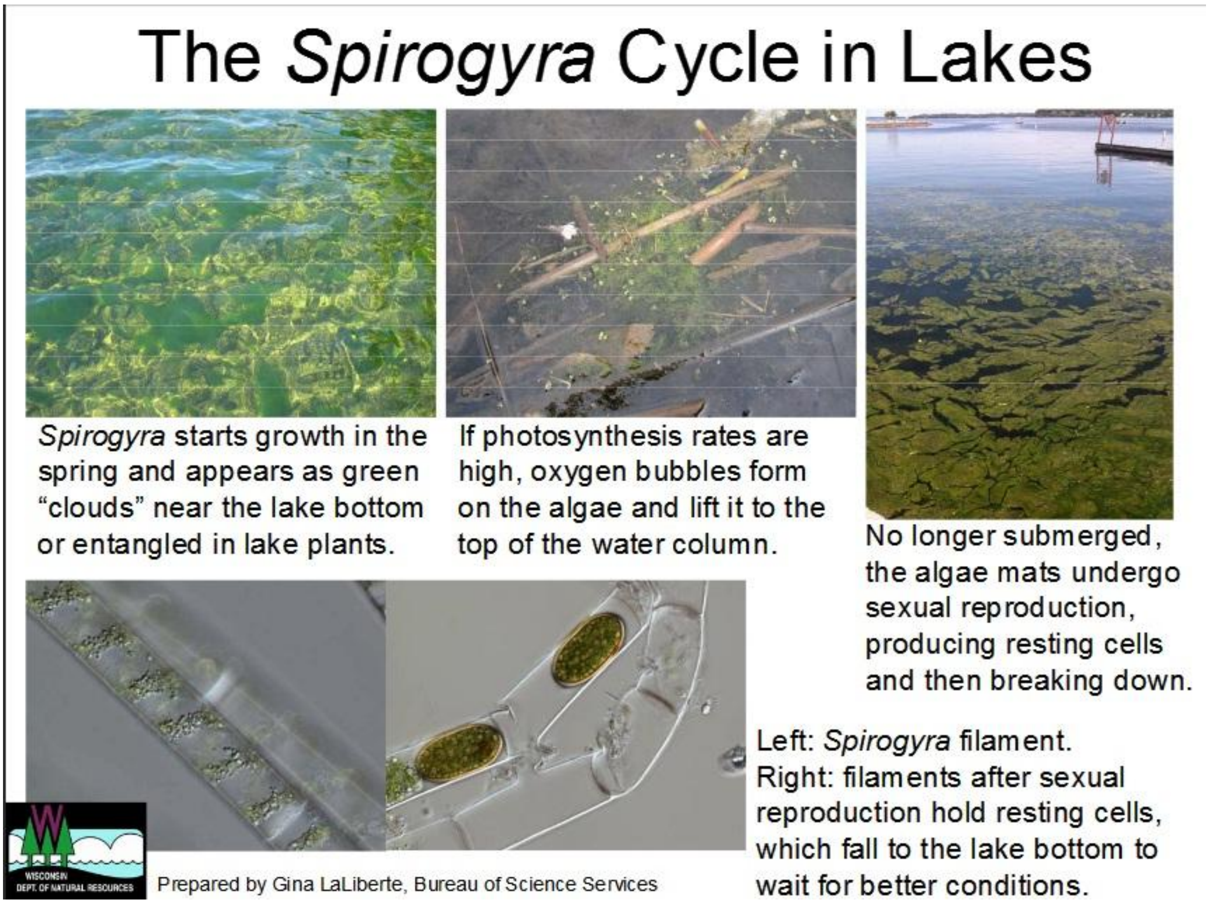
Garnish with a pond and many garden plants that tolerate excess moisture . This is a different kind of host and astilbes , meadowsweet white and purple, globe- hybrid , species and varieties of Ligularia , primrose , saxifrage . A little further from the pond can be planted daylilies , Siberian iris , Rogers , cuff , ferns . Sometimes planted weeping willows and other shrubs

Azolla caroliniana.. good Weed!

It is able to fix nitrogen from air by means of symbiotic cyanobacteria/blue-green algae ***Anabaena azolle***

--Dead Azolla though, can reduce the waters' oxygen content in a body of water for a time—

It is of commercial importance in cultivation in southern and eastern Asia as a bio-fertilizer, benefits



The *Spirogyra* Cycle in Lakes

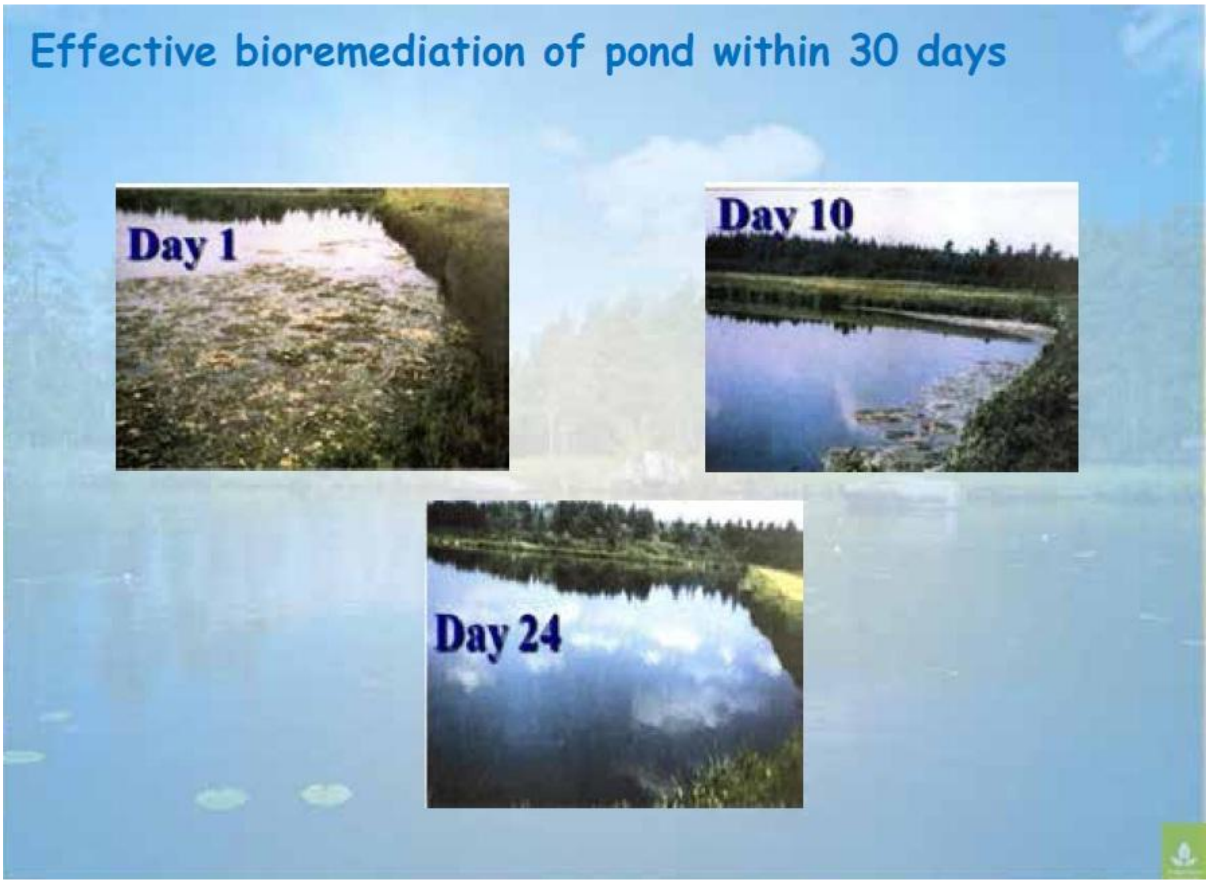
Spirogyra starts growth in the spring and appears as green "clouds" near the lake bottom or entangled in lake plants.

If photosynthesis rates are high, oxygen bubbles form on the algae and lift it to the top of the water column.

No longer submerged, the algae mats undergo sexual reproduction, producing resting cells and then breaking down.

Left: *Spirogyra* filament.
Right: filaments after sexual reproduction hold resting cells, which fall to the lake bottom to wait for better conditions.

Prepared by Gina LaLiberte, Bureau of Science Services



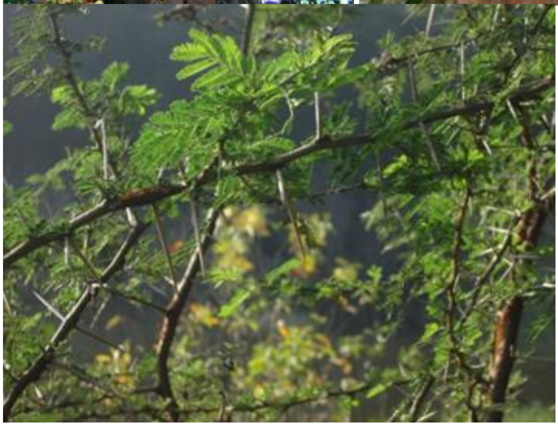
Effective bioremediation of pond within 30 days

Planted Lilies

Very hardy herbs flowering in middle of driest summer!

Baby Wild Jamun survives a Fire

photos-depot.com



© 2005 QT Luong / terragalleria.com

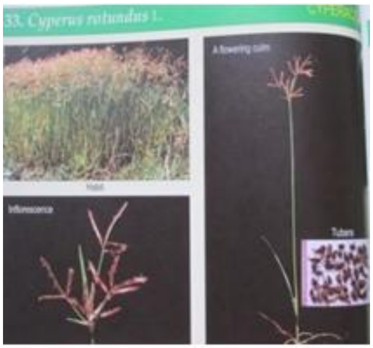
25. Centella asiatica (L.) Urban
APIACEAE (Umbe
Habit
Fruits

27. Clitoria ternatea L.
FABA
Flowers in different hues
Habit
Flower with multi-storied corolla

28. Coccinia grandis (L.) Voigt
[= C. indica Wight & Arn.]
CUCURBITACEAE
Habit
Flower
Twig with flowers
Unripe fruit
Ripe fruit

herbs spotted in the vicinity

31. Curculigo orchioides Gaertn.
HYPOXIDA
Fruit
Entire plant
Plant with flowe


33. Cyperus rotundus L.
CYPER
A flowering culm
Habit
Inflorescence
Tubers

32. Cynodon dactylon (L.) Pers.
POACEAE
Plants with inflorescence
Habit
Flowering culms

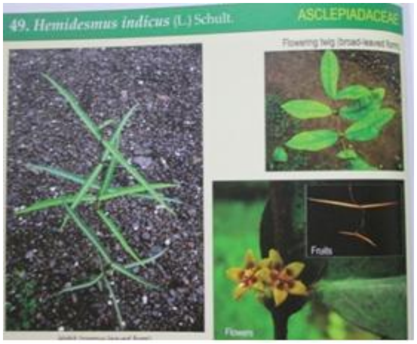
34. Datura metel L. [= D. alba L.; D. fastuosa non L.]
SOLANACEAE
Habit
Twig with flow

38. Diplocyclos palmatus (L.) C.Jeffrey
[= Bryonopsis laciniosa auct. non (L.) Naudin
CUCURBITACEAE
Flower & young fruits
Habit
Fruits

39. Dodonaea angustifolia L.f.
[= D. viscosa auct. non Jacq.]
SAPINDA
Habit
Flowering twigs
Flowers
Fruiting branches

40. Eclipta prostrata (L.) L. [= E. alba Hassk.]
ASTERACEAE (Compositae)
Habit
A flowering head
Twig with flowering & fruiting heads

42. Euphorbia hirta L.
EUPHORBIACEAE
Habit
Flowering twigs of green & reddish forms of plants


49. Hemidesmus indicus (L.) Schult.
ASCLEPIADACEAE
Flowering twig (broad-leaved form)
Fruits
Flowers

.

52. *Hybanthus enneaspermus* (L.f.) Muell.
[= *Ionidium suffruticosum* (L.) Ging. ex DC.] VIOLACEAE

Twig with flowers & fruits
Flowering branch

Leucas aspera (Willd.) Spreng. LAMIACEAE (Labiatae)

Flowering twigs

63. *Mukia maderaspatana* (L.) Roem.
[= *M. scabrella* (L.f.) Arn.; *Melothria maderaspatana* (L.) Gagnep.]

Flowering twig

64. *Murraya koenigii* (L.) Spr. RUTACEAE

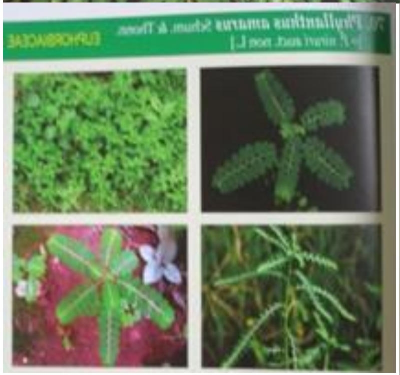
Flowering branch
Fruits

67. *Ocimum basilicum* L. LAMIACEAE

Flowering twig of
O. basilicum var. purpurascens
Twig with flowers

Ocimum tenuiflorum L. [= *O. sanctum* L.] LAMIACEAE

Flowering twigs


Phyllanthus amarus Schum. & Thonn.
[= *P. niruri* auct. non L.] EUPHORBIACEAE

72. *Plectranthus amboinicus* (Lour.) Spreng.
[= *Coleus aromaticus* Benth.] LAMIACEAE

Flowering twig
Habit
Flowers
Leafy twig

Ricinus communis L. EUPHORBIACEAE

Inflorescence
Population
Infructescence
Habit

81. *Sida acuta* Burm.f.
[= *S. carpinifolia* L.; *S. lanceolata* Roxb.] MALVACEAE

Habit
Twig with flowers & fruits
(narrow-leaved form)
Flowering twig
(broad-leaved form)

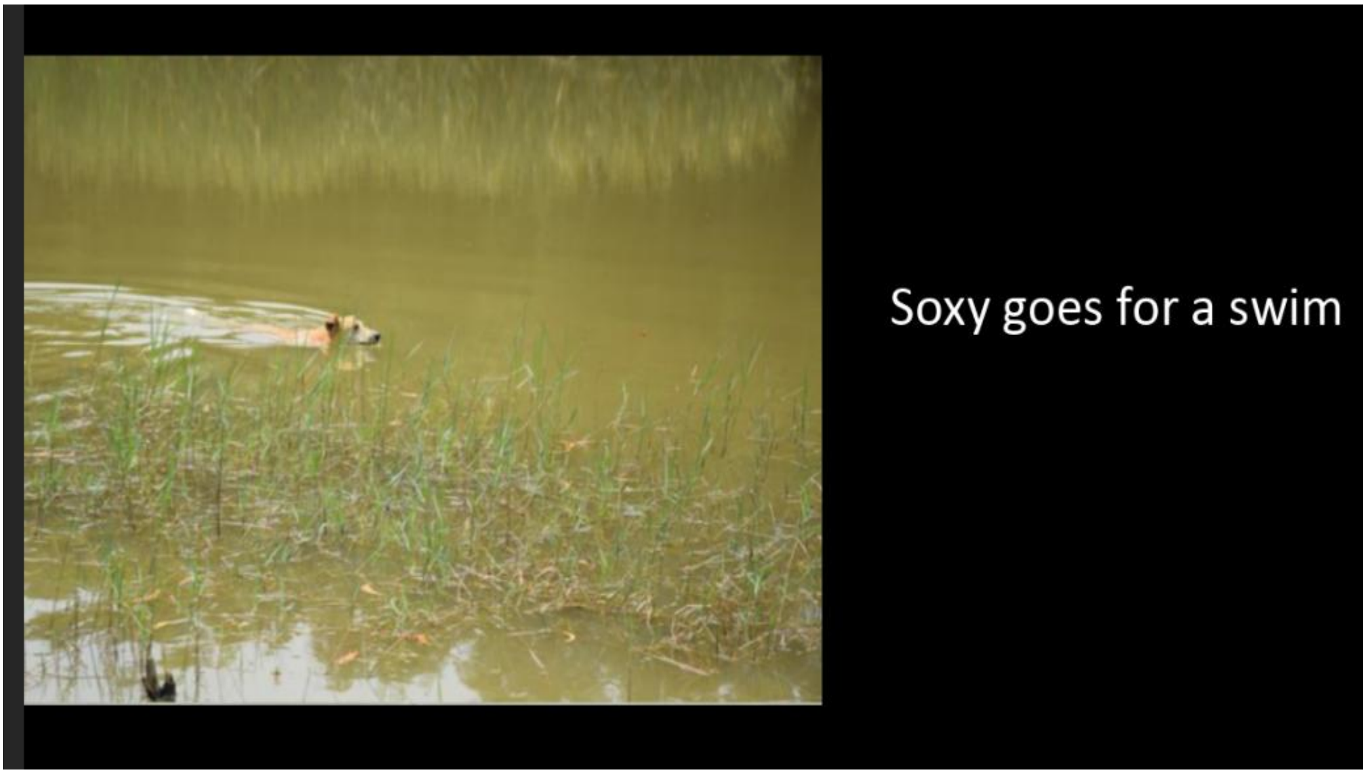
Sida cordata (Burm.f.) Borss.Waalk.
[= *S. veronicaefolia* Lam.] MALVACEAE

Twig with flowers & fruits
Flowering twig

83. *Solanum nigrum* L. [= *S. americanum* L.] SOLANACEAE

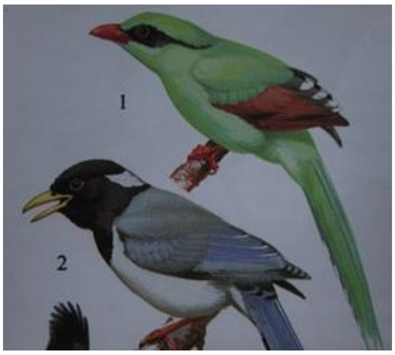
Flowers
Flowering twig
Fruiting twig
Habit

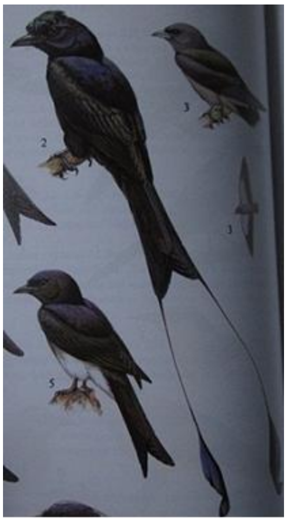
NESTS collected nearby,   ..as well as locations of spotted nests in past 6 months



Soxy goes for a swim

Some of the Uncommon Birds we Have Seen in the Lake Area Over the Years :





196. Common Tailorbird

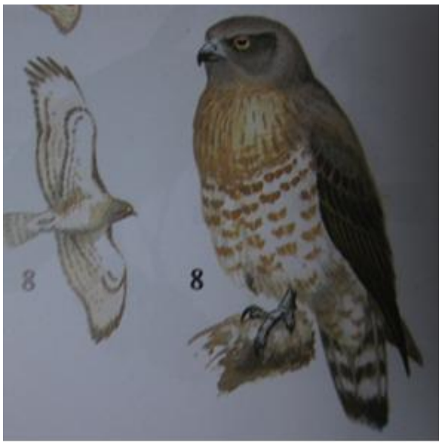
13 cm

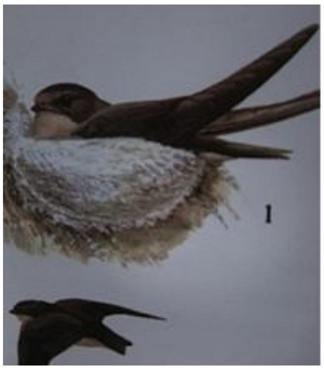
Alternate name(s) : Tailor bird

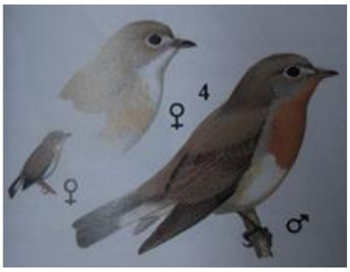
Scientific Name : *Orthotomus sutorius*

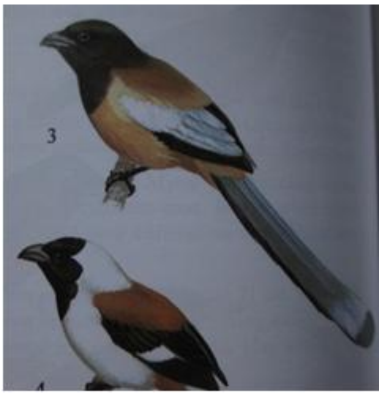
nate name(s) : Pied Wagtail, Indian White Wagtail, Indian Masked Wagtail.

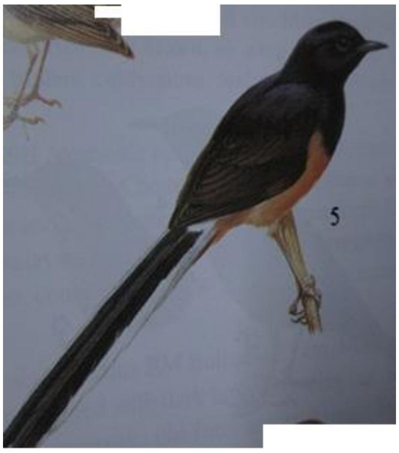
tific Name : *Motacilla alba*

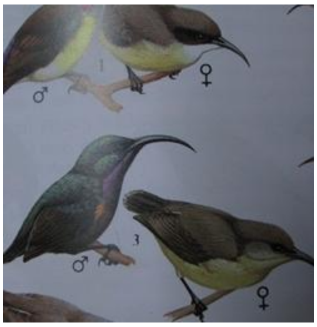


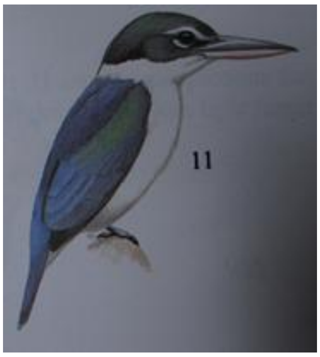












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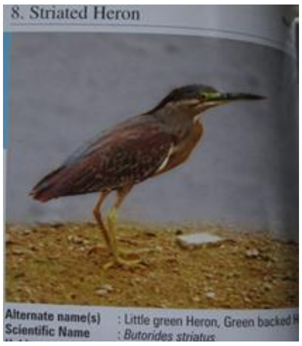
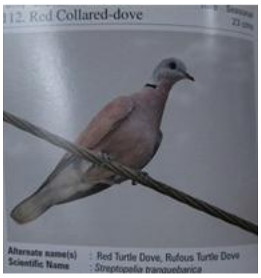
8. Striated Heron



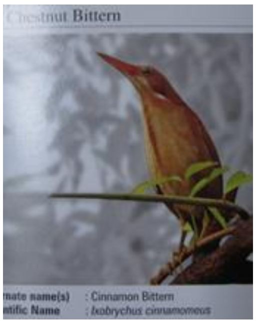
Alternate name(s) : Little green Heron, Green backed H
Scientific Name : *Butorides striatus*

112. Red Collared-dove 23 cms



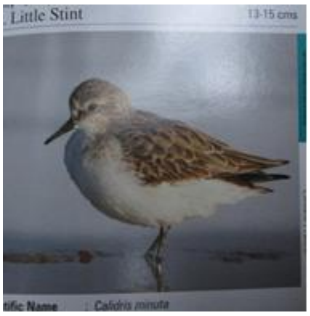
Alternate name(s) : Red Turtle Dove, Rufous Turtle Dove
Scientific Name : *Streptopelia tranquebarica*

Chestnut Bittern

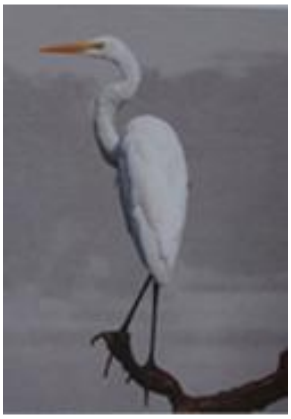


nate name(s) : Cinnamon Bittern
ntific Name : *Ixobrychus cinnamomeus*

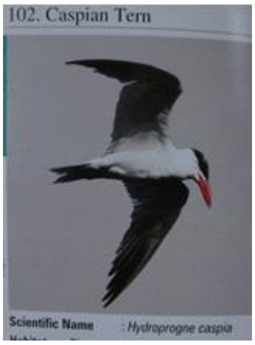
Little Stint 13-15 cms



tific Name : *Calidris minuta*

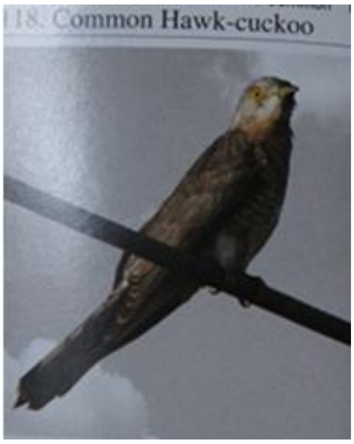


102. Caspian Tern

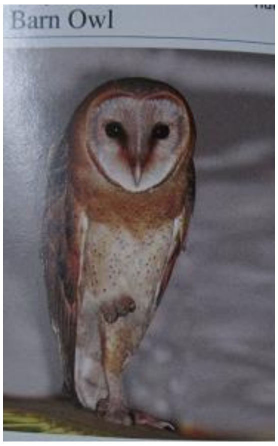


Scientific Name : *Hydroprogne caspia*

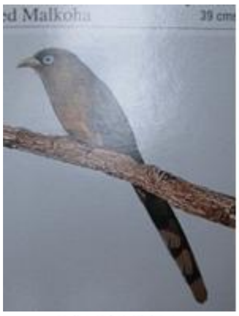
118. Common Hawk-cuckoo



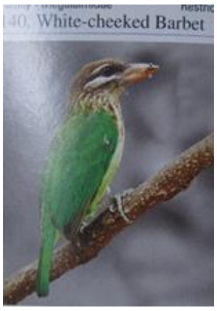
Barn Owl



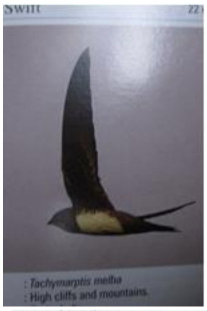
d Malkoha 39 cm



140. White-cheeked Barbet

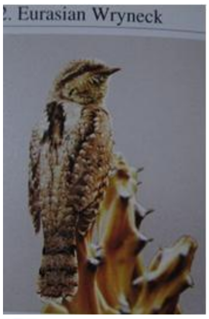


Swift

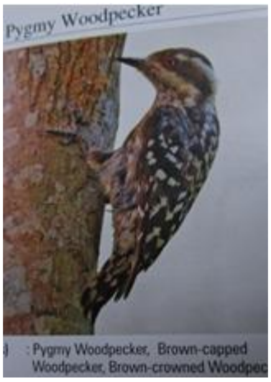


: *Tachymarptis melba*
: High cliffs and mountains.

2. Eurasian Wryneck

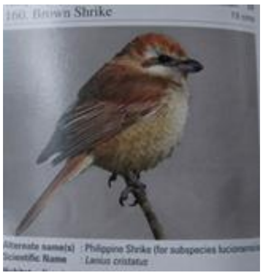


Pygmy Woodpecker



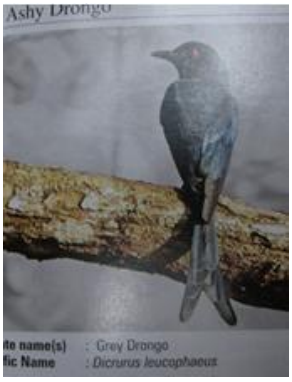
: Pygmy Woodpecker, Brown-capped Woodpecker, Brown-crowned Woodpec

160. Brown Shrike 19 cms



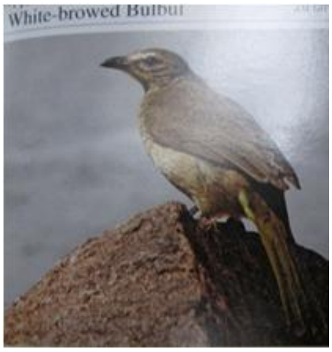
Alternate name(s) : Philippine Shrike (for subspecies lucionensis
Scientific Name : *Lanius cristatus*

Ashy Drongo

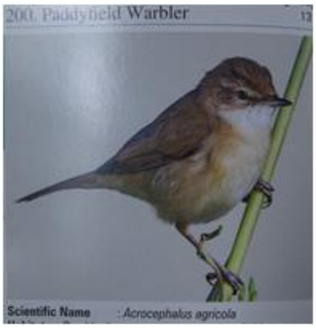


te name(s) : Grey Drongo
fic Name : *Dicrurus leucophaeus*

White-browed Bulbul

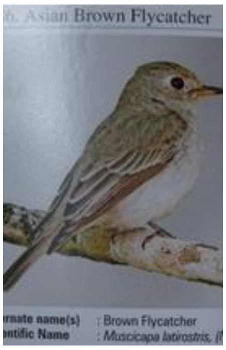


200. Paddyfield Warbler 13



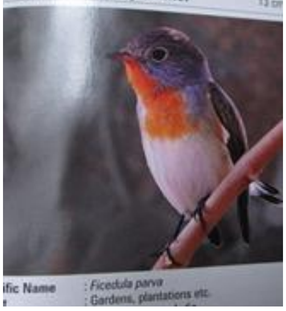
Scientific Name : *Acrocephalus agricola*

6. Asian Brown Flycatcher



rnate name(s) : Brown Flycatcher
ntific Name : *Muscicapa latirostris, (*

. Red-breasted Flycatcher Rare 13 cm



ific Name : *Ficedula parva*
: Gardens, plantations etc.

LOVE LAKES

LIVE LIFE

*

☺

Comparative of our Revived Lake Portion and other Attempts :

IISc Storm Water Pond, left alone, almost natural

Our Naturally Revived Wild Lake, after rains

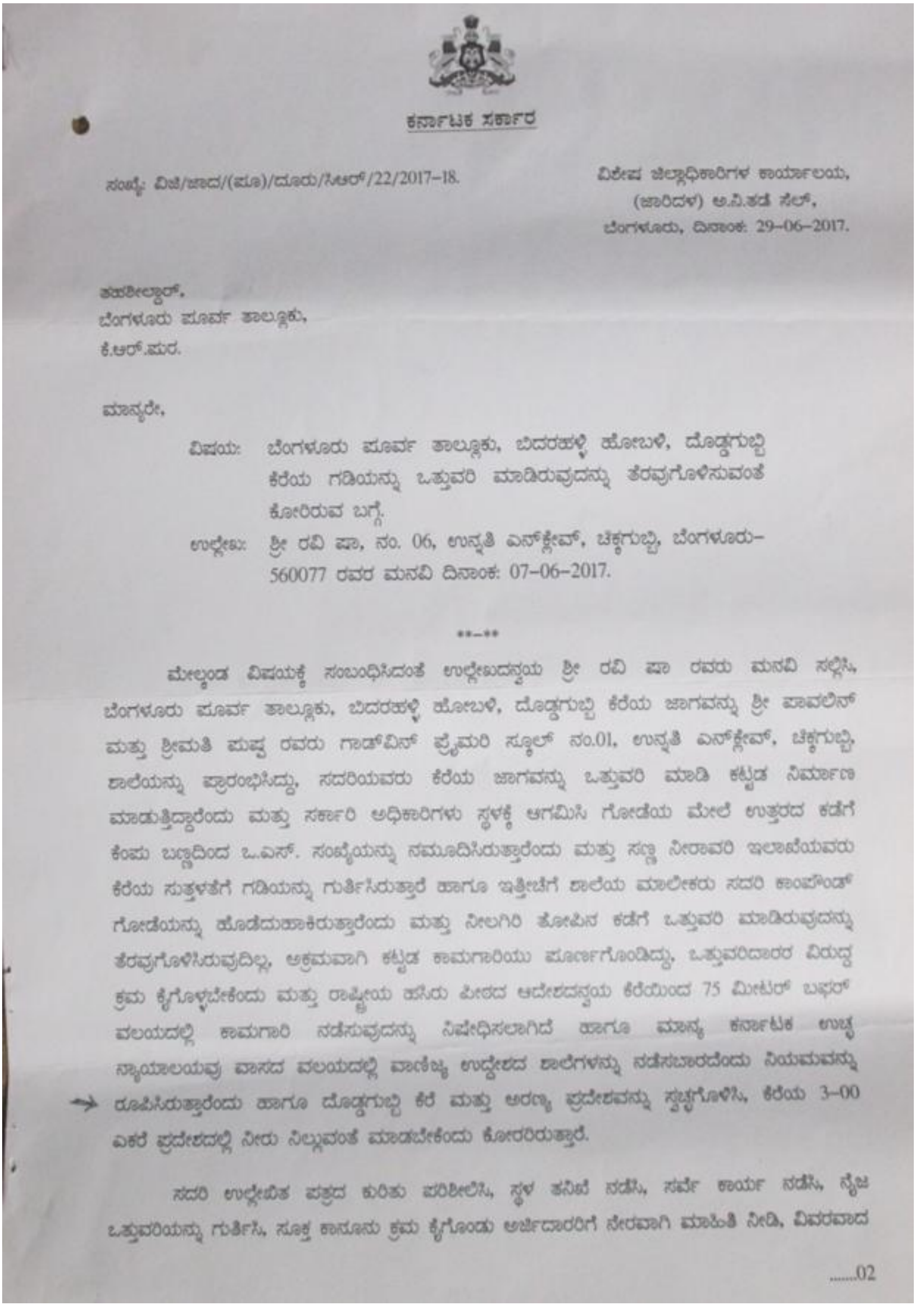
(..and from the other side)

Jakkur Lake.. dirty within a month after the new STP!

It is easy to make out the difference in the health of the tank waters.. it is visible ours is more Alive!

“Even the *slightest bit of* ***Sewage*** entry ***kills*** mini flora-fauna that are crucial to the lake eco-system.”

- Dr. Subbu Subramanya, GKVK Scientist, Expert Ornithologist



ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಸಂಖ್ಯೆ: ವಿಜಿ/ಜಾದ/(ಪೂ)/ದೂರು/ಸಿಆರ್/22/2017-18.

ವಿಶೇಷ ಜಿಲ್ಲಾಧಿಕಾರಿಗಳ ಕಾರ್ಯಾಲಯ,
(ಜಾರಿದಳ) ಅ.ನಿ.ತಡೆ ಸೆಲ್,
ಬೆಂಗಳೂರು, ದಿನಾಂಕ: 29-06-2017.

ತಹಶೀಲ್ದಾರ್,
ಬೆಂಗಳೂರು ಪೂರ್ವ ತಾಲ್ಲೂಕು,
ಕೆ.ಆರ್.ಪುರ.

ಮಾನ್ಯರೇ,

ವಿಷಯ: ಬೆಂಗಳೂರು ಪೂರ್ವ ತಾಲ್ಲೂಕು, ಬಿದರಹಳ್ಳಿ ಹೋಬಳಿ, ದೊಡ್ಡಗುಬ್ಬಿ ಕೆರೆಯ ಗಡಿಯನ್ನು ಒತ್ತುವರಿ ಮಾಡಿರುವುದನ್ನು ತೆರವುಗೊಳಿಸುವಂತೆ ಕೋರಿರುವ ಬಗ್ಗೆ.

ಉಲ್ಲೇಖ: ಶ್ರೀ ರವಿ ಷಾ, ನಂ. 06, ಉನ್ನತಿ ಎನ್‌ಕ್ಲೇವ್, ಚಿಕ್ಕಗುಬ್ಬಿ, ಬೆಂಗಳೂರು-560077 ರವರ ಮನವಿ ದಿನಾಂಕ: 07-06-2017.

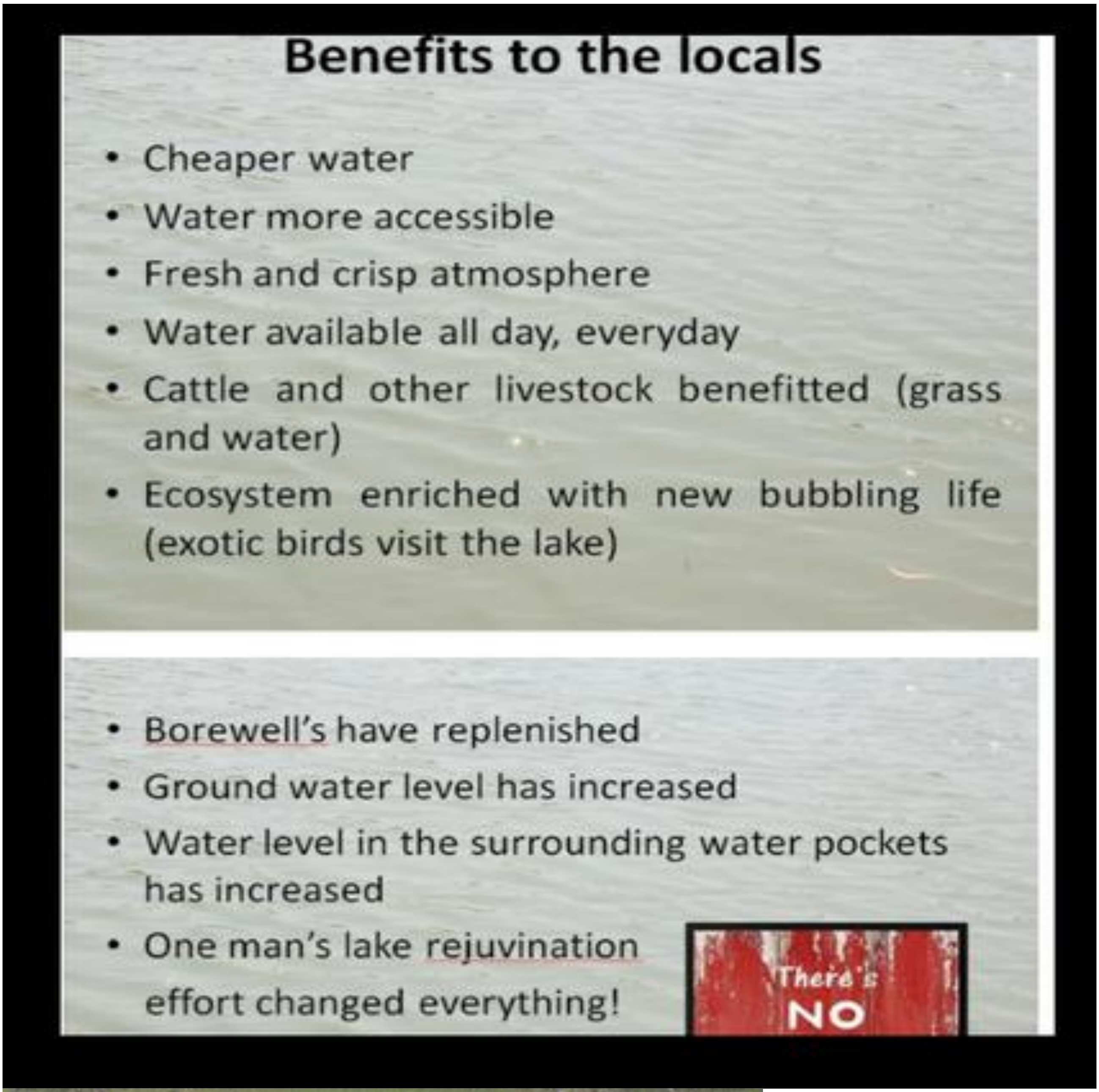
–

ಮೇಲ್ಕಂಡ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ಉಲ್ಲೇಖದನ್ವಯ ಶ್ರೀ ರವಿ ಷಾ ರವರು ಮನವಿ ಸಲ್ಲಿಸಿ, ಬೆಂಗಳೂರು ಪೂರ್ವ ತಾಲ್ಲೂಕು, ಬಿದರಹಳ್ಳಿ ಹೋಬಳಿ, ದೊಡ್ಡಗುಬ್ಬಿ ಕೆರೆಯ ಜಾಗವನ್ನು ಶ್ರೀ ಪಾವಲಿನ್ ಮತ್ತು ಶ್ರೀಮತಿ ಪುಷ್ಪ ರವರು ಗಾಡ್‌ವಿನ್ ಪ್ರೈಮರಿ ಸ್ಕೂಲ್ ನಂ.01, ಉನ್ನತಿ ಎನ್‌ಕ್ಲೇವ್, ಚಿಕ್ಕಗುಬ್ಬಿ, ಶಾಲೆಯನ್ನು ಪ್ರಾರಂಭಿಸಿದ್ದು, ಸದರಿಯವರು ಕೆರೆಯ ಜಾಗವನ್ನು ಒತ್ತುವರಿ ಮಾಡಿ ಕಟ್ಟಡ ನಿರ್ಮಾಣ ಮಾಡುತ್ತಿದ್ದಾರೆಂದು ಮತ್ತು ಸರ್ಕಾರಿ ಅಧಿಕಾರಿಗಳು ಸ್ಥಳಕ್ಕೆ ಆಗಮಿಸಿ ಗೋಡೆಯ ಮೇಲೆ ಉತ್ತರದ ಕಡೆಗೆ ಕೆಂಪು ಬಣ್ಣದಿಂದ ಓ.ಎಸ್. ಸಂಖ್ಯೆಯನ್ನು ನಮೂದಿಸಿರುತ್ತಾರೆಂದು ಮತ್ತು ಸಣ್ಣ ನೀರಾವರಿ ಇಲಾಖೆಯವರು ಕೆರೆಯ ಸುತ್ತಳತೆಗೆ ಗಡಿಯನ್ನು ಗುರ್ತಿಸಿರುತ್ತಾರೆ ಹಾಗೂ ಇತ್ತೀಚೆಗೆ ಶಾಲೆಯ ಮಾಲೀಕರು ಸದರಿ ಕಾಂಪೌಂಡ್ ಗೋಡೆಯನ್ನು ಹೊಡೆದುಹಾಕಿರುತ್ತಾರೆಂದು ಮತ್ತು ನೀಲಗಿರಿ ತೋಪಿನ ಕಡೆಗೆ ಒತ್ತುವರಿ ಮಾಡಿರುವುದನ್ನು ತೆರವುಗೊಳಿಸಿರುವುದಿಲ್ಲ, ಅಕ್ರಮವಾಗಿ ಕಟ್ಟಡ ಕಾಮಗಾರಿಯು ಪೂರ್ಣಗೊಂಡಿದ್ದು, ಒತ್ತುವರಿದಾರರ ವಿರುದ್ಧ ಕ್ರಮ ಕೈಗೊಳ್ಳಬೇಕೆಂದು ಮತ್ತು ರಾಷ್ಟ್ರೀಯ ಹಸಿರು ಪೀಠದ ಆದೇಶದನ್ವಯ ಕೆರೆಯಿಂದ 75 ಮೀಟರ್ ಬಫರ್ ವಲಯದಲ್ಲಿ ಕಾಮಗಾರಿ ನಡೆಸುವುದನ್ನು ನಿಷೇಧಿಸಲಾಗಿದೆ ಹಾಗೂ ಮಾನ್ಯ ಕರ್ನಾಟಕ ಉಚ್ಛ ನ್ಯಾಯಾಲಯವು ವಾಸದ ವಲಯದಲ್ಲಿ ವಾಣಿಜ್ಯ ಉದ್ದೇಶದ ಶಾಲೆಗಳನ್ನು ನಡೆಸಬಾರದೆಂದು ನಿಯಮವನ್ನು ರೂಪಿಸಿರುತ್ತಾರೆಂದು ಹಾಗೂ ದೊಡ್ಡಗುಬ್ಬಿ ಕೆರೆ ಮತ್ತು ಅರಣ್ಯ ಪ್ರದೇಶವನ್ನು ಸ್ವಚ್ಛಗೊಳಿಸಿ, ಕೆರೆಯ 3-00 ಎಕರೆ ಪ್ರದೇಶದಲ್ಲಿ ನೀರು ನಿಲ್ಲುವಂತೆ ಮಾಡಬೇಕೆಂದು ಕೋರರಿರುತ್ತಾರೆ.

ಸದರಿ ಉಲ್ಲೇಖಿತ ಪತ್ರದ ಕುರಿತು ಪರಿಶೀಲಿಸಿ, ಸ್ಥಳ ತನಿಖೆ ನಡೆಸಿ, ಸರ್ವೆ ಕಾರ್ಯ ನಡೆಸಿ, ನೈಜ ಒತ್ತುವರಿಯನ್ನು ಗುರ್ತಿಸಿ, ಸೂಕ್ತ ಕಾನೂನು ಕ್ರಮ ಕೈಗೊಂಡು ಅರ್ಜಿದಾರರಿಗೆ ನೇರವಾಗಿ ಮಾಹಿತಿ ನೀಡಿ, ವಿವರವಾದ

......02

District Commissioner, Bangalore City – Letter to Taluk Office – **to protect our Revived Pond**



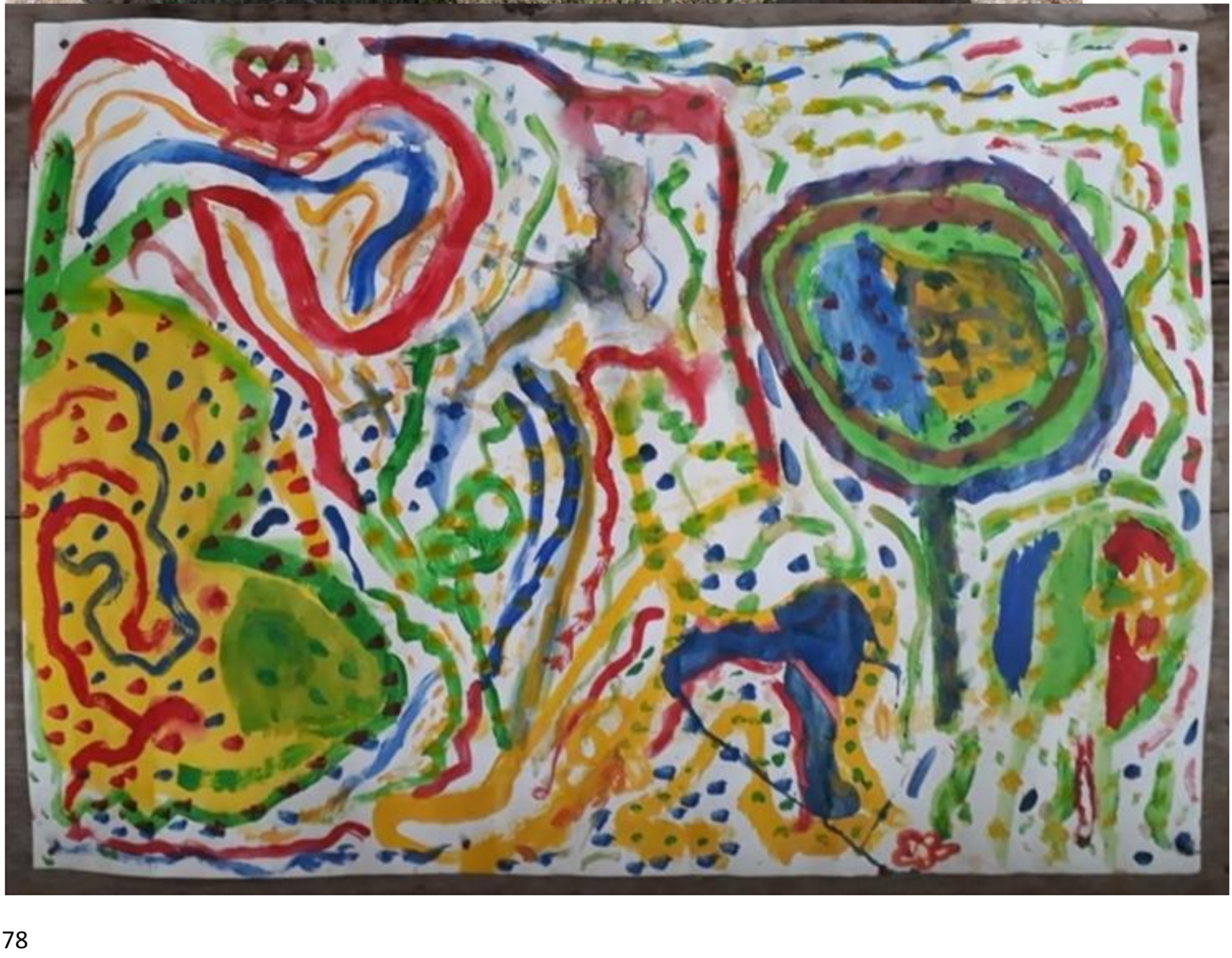
Benefits to the locals

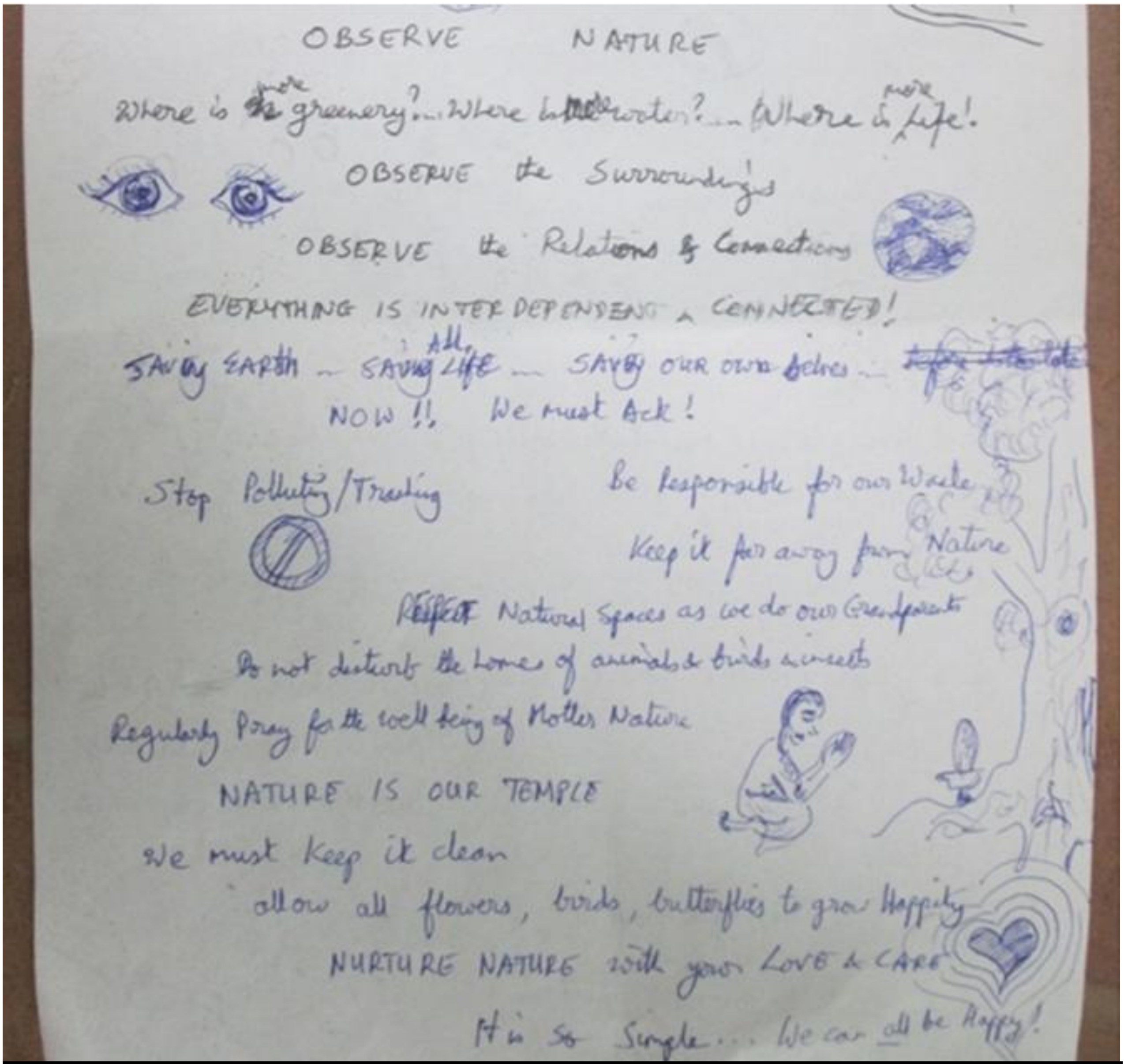
- Cheaper water
- Water more accessible
- Fresh and crisp atmosphere
- Water available all day, everyday
- Cattle and other livestock benefitted (grass and water)
- Ecosystem enriched with new bubbling life (exotic birds visit the lake)

- Borewell's have replenished
- Ground water level has increased
- Water level in the surrounding water pockets has increased
- One man's lake rejuvination effort changed everything!

R. Jeyanth (MEE14070)
R. Krishna Kumar (MEE14071)
Ritwik Gantayat (MEE14078)
Siddharth Ramesh (MEE14081)
Supreeth Gaddam (MEE14087)
R. A. Raaj Kumar (MEE14511)

AMRITA
VISHWA VIDYAPEETHAM
UNIVERSITY





OBSERVE NATURE

Where is ~~the~~ more greenery?... Where ~~little~~ water?... Where is more life!

OBSERVE the Surroundings

OBSERVE the Relations & Connections

EVERYTHING IS INTERDEPENDENT & CONNECTED!

SAVING EARTH ... SAVING ALL LIFE ... SAVING OUR OWN selves ... ~~before it is too late~~

NOW !! We must Act!

Stop Polluting/Trashing

Be Responsible for our Waste

Keep it far away from Nature

RESPECT Natural Spaces as we do our Grandparents

Do not disturb the homes of animals & birds & insects

Regularly Pray for the well being of Mother Nature

NATURE IS OUR TEMPLE

We must Keep it clean

allow all flowers, birds, butterflies to grow Happily

NURTURE NATURE with your LOVE & CARE

It is so Simple... We can all be Happy!

Streamside or Riparian Forest Buffers

Buffer widths vary from 50 feet, providing some bank stability **to 250 feet**, providing **flood mitigation** and **wildlife habitat**. Planting new buffers has become a **state priority** over the last **10 years**, but regulations to protect existing buffers from removal do not exist. Some municipalities have adopted ordinances to protect riparian forest buffers, and model ordinances do exist (Montgomery County Planning).

Charles Eisenstein [eco-author] https://charleseisenstein.org/essays/**ceremony**

We to recognise the next step forward in the deepening of a ceremonial relationship. Recently **I've been corresponding with Ravi Shah**, a young man in India who is **doing breathtaking work regenerating ponds & surrounding land**. **Following example of Masanobu Fukuoka**, he exercises the most delicate attention, placing some reeds here, removing an invasive tree there, trusting in the innate regenerative powers of nature. **The more he minimizes his interference, the greater its effect.** That is not to imply zero interference would be the most powerful of all. It is that the finer and **more precise his understanding**, the better able he is to align with and serve nature's movement, and the less he needs to interfere to accomplish that. The result is that he has created – or more accurately, served the creation of – a lush & verdant oasis in a deteriorating landscape; a living altar

Ravi is understandably impatient with large scale water restoration projects like those I described in my book: Rajendra Singh's work in India and the Loess Plateau restoration, China, which **come nowhere near to his degree of reverence and attention to micro-local detail**. Those projects arise from a more conventional, mechanistic understanding of hydrology. Where is the **sacredness**? he asks. Where is the humbling to the exquisite wisdom of **interdependent ecosystems unique to each place**? They're just building ponds. Maybe so, I said, but we must meet people where they are, and celebrate each step in the right direction. These mechanistic hydrological projects also carry within them reverence for water. Ravi's project can offer a glimpse of what might be.

I would add to that, that for land to heal it needs an example of health, **a reservoir of health** from which to learn. The oasis of ecological health he has established **can radiate outward** through the social and ecological surroundings, transmitting health to nearby places (for eg: by providing refuge and spawning grounds for plants and animals) and **transmitting inspiration** to other earth healers. That is why **the Amazon is so crucial**, especially its headwaters region, which is possibly the largest intact reservoir and font of ecological health in the world. It is where Gaia's memory of health, of a past and future healed world, still resides intact.

Ravi's earth repair work functions exactly **as a ceremony**. One could say, "Don't make special ceremonies – **every act** should be **a ceremony**. Why single out those ten minutes as special." The same way, one could insist **every place on Earth** be **immediately treated as Ravi treats** his. Most of us though, like society as a whole, are not ready for such a step. The chasm is too great. We cannot expect to undo our techno-industrial systems, social systems, or our deeply programmed psychology overnight. What works for most of us is to establish one oasis of perfection – the ceremony – as best we are able, and then to allow it to ripple out across our life-scape, progressively bringing more attention, **beauty**, and power into every act. To make every act a ceremony begins with making one act a ceremony

In performing the ceremony, we intend that it radiate through our day or week. It is a touchstone amidst life's sturm and drang. So also, we are not to merely preserve a few wild places, sanctuaries, or national parks, or restore a few places to pristine condition; rather, these places are lodestars: examples and reminders of what is possible. As **people like Ravi steward** such places, we are called to bring a bit of them, and then more and more of them, to all places. As we establish a tiny moment of ceremony in our lives, we are called to bring a bit of it, and then more and more of it, to all moments..

https://charleseisenstein.org/essays/**ceremony**

On 01/03/2019, Judith D. Schwartz <judithd@sover.net> wrote:

> Hello Ravi. Thank you for sharing this Forest-Lake project. What was your
> involvement in this? It looks like you were the main organizer and that this
> was part of a university project. What can I do for you? Are you hoping that
> I will share it? I will be happy to do so on social media among groups
> interested in ecological restoration, particularly among watersheds. Are you
> connected with the Ecosystem Restoration Camps group?
>
> Anyway, I am glad that you reached out to me on this. I'd be interested to
> know if similar projects are underway.
>
> Very best wishes from the U.S.,
>
> Judy
>
> 955 Mt. Anthony Road
> Bennington, Vermont
> (802) 447-2413
> (802) 379-5368 (cell)
> www.judithdschwartz.com <http://www.judithdschwartz.com/>
> Author: Cows Save the Planet: And Other Improbable Ways of Restoring Soil to
> Heal the Earth (Chelsea Green Publishing)
> Water In Plain Sight: Hope for a Thirsty World (St. Martin's Press)

Dear Ravi,

Thanks for telling me about your project. I have never worked in this kind of area of research and have no idea how you could put it on to a more effective scientific basis. All scientific experiments essentially involve comparisons. You have before and after comparisons but there are many other variables that could affect them, including changes in the water table. The other comparison would be to compare areas that you've connected with spiritually or through ceremonies and prayers with areas that you have not. This would have to be a randomised trial and such trials done outdoors are very difficult to get conclusive results from because there's so much variation from place to place anyway. To design this would be quite an elaborate experiment and I could not advise on the details from this distance. Sorry not to be able to help more but I wish you well with your project.

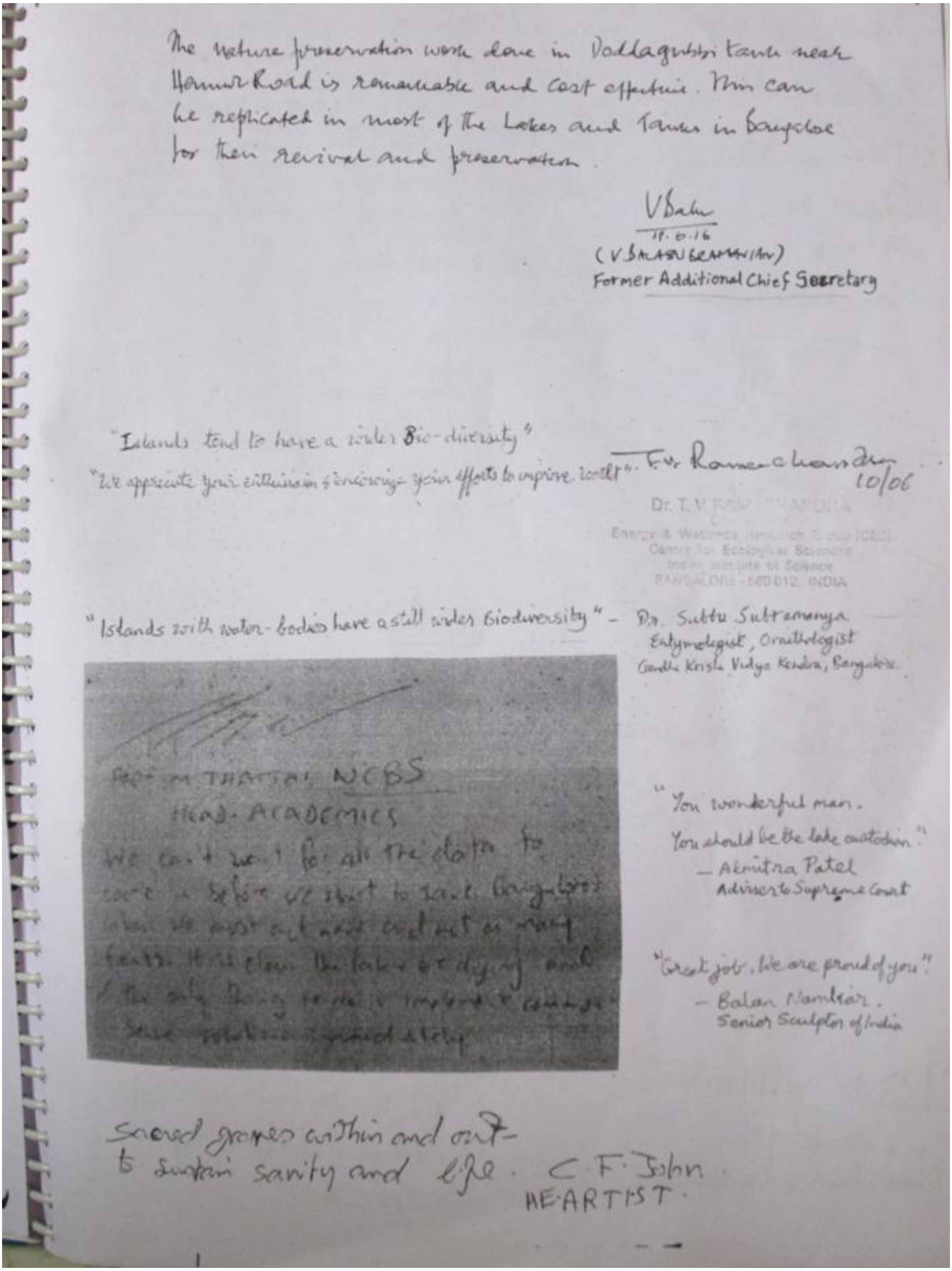
Best wishes Rupert Sheldrake <rsheldrake@clara.co.uk>

Pam Smart 17 December 2018 at 15:07

<p.e.smart57@gmail.com>

Dear Ravi,

Thank you for your fascinating email, which I will pass onto Rupert Sheldrake for his reply. Good luck with your project. Best wishes Pam Smart (Researcher)



The nature preservation work done in Doddagubbi tank near Hennur Road is remarkable and cost effective. This can be replicated in most of the Lakes and Tanks in Bangalore for their revival and preservation.

V Balu
11.6.16
(V. BALASUBRAMANIAN)
Former Additional Chief Secretary

"Islands tend to have a wider Bio-diversity"
"We appreciate your enthusiasm & encourage your efforts to improve world". T.V. Ramachandra
10/06

Dr. T.V. RAMACHANDRA
Energy & Wetlands Research Group (CES)
Centre for Ecological Sciences
Indian Institute of Science
BANGALORE - 560 012, INDIA

"Islands with water-bodies have a still wider Biodiversity" – Dr. Subbu Subramanya
Entymologist, Ornithologist
Gandhi Krishi Vidya Kendra, Bangalore.

PROF M THATTAI NCBS
HEAD-ACADEMICS
We can't wait for all the data to come in before we start to save Bangalore's lakes. We must act now and act on many fronts. It is clear the future is drying and the only thing to do is implement common-sense solutions [illegible] step

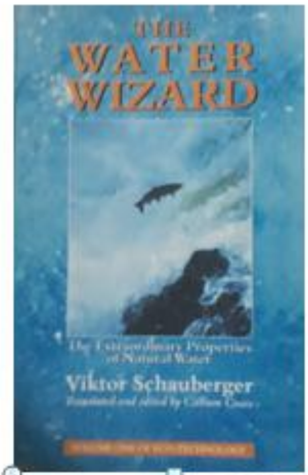
"You wonderful man.
You should be the lake custodian."
– Almitra Patel
Adviser to Supreme Court

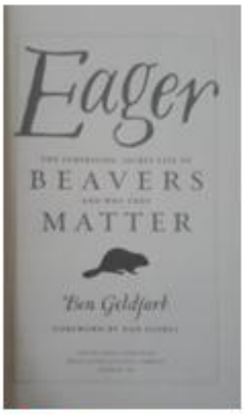
"Great job. We are proud of you."
– Balan Nambiar.
Senior Sculptor of India

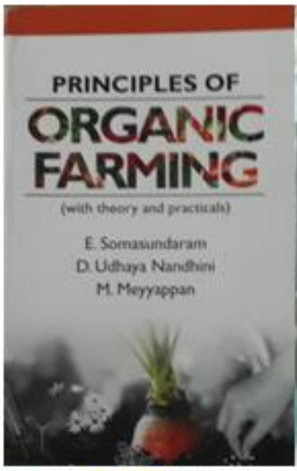
Sacred groves within and out-
to sustain sanity and life. C F John
HE ARTIST.

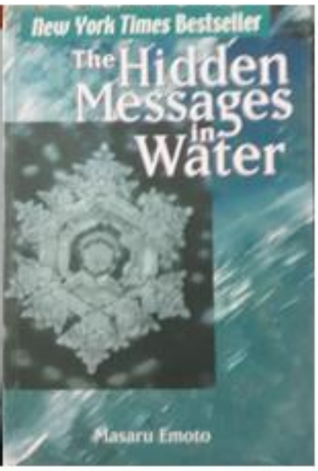
i) First made personal appeal to Laundry Managers [Received Threats to my Personal Safety]
ii) Theodore Bhaskaran – Doddagubbi resident, Bird Watcher & Activist
iii) Achappa – Doddagubbi resident and social activist
iv) Narayan Swami – Doddagubbi farmer and social worker
v) Siddappa – Doddagubbi farmer and environmentalist
vi) Ramesh – Chikkagubbi Congress party member & social worker
vii) Nagesh – Byrathi – member, nature lover, activist
viii) Manjunath – Golahalli Lawyer and Social Activist
ix) Rajanna – Regional Conservator of Forests, Doddagubbi Gram Panchayat
x) Ramprasad – Friends of Lakes NGO
xi) Phani Sai – Lok Satta Party Member & Environmental Activist
xii) Sridhar Pabbisetty – CEO Namma Bengaluru NGO
xiii) Leo Saldanha – Coordinator Environment Security Group NGO
xiv) Venkat Balasubramanian – Former Addtional Chief Secretary + Head of Lakes, Blr. Env. Trust
xv) Vijay Nishant – Atree NGO, Bird Watcher + Tree Doctor
xvi) MS Sharath – nano tech scientist, martial artist, nature lover
xvii) Dr. Subbu Subramanya – Entymologist, Gandhi Krishi Vidya Kendra
xviii) Prof. Mukund Thattai – Microbiologist, National Center for Biological Sciences
xix) MRS Rao – former Head of Jawaharlal Nehru Center for Agricultural Sciences
xx) Dr. TV Ramachandra – head of EnVIS, Indian Institute of Science
xxi) Dr. Sharad Lele – IISc researcher and Lake Revival Activist
xxii) Ananda Gaddam – IISc scientist and environmentalist
xxiii) Rhezumalai – Scientist, Central Govt. Wood Science Institute, Bangalore
xxiv) Dr. Ganesh Babu – Native Horticultural Researcher, Nursery Head – FRLHT, I-AIM
xxv) Satyajit Mayor – Head Admin, NCBS
xxvi) Doctor Panduranga – Homeopath, Acupuncturist, Naturalist
xxvii) Doctore Shashikant – Psychologist, Nature Curer, Alternative Therapist, Activist
xxviii) Doctor Shrikant – Ayurved, Naturalist, Environmental Activist
xxix) Doctor Wahab Hazrat Inayat Khan – Natural Healer, Social Worker
xxx) Valsan Koorma Kolleri – Artist, Naturalist, Activist
xxxi) Eva & Balan Nambiar – Artist, Activist, Nature Lover
xxxii) Gaurav – Environmentalist, Teacher, Wildlife Activist
xxxiii) CF John – Artist, Social Worker, Environmentalist
xxxiv) Vivek Vilasini – Artist, Actor, Environmentalist, Social Worker
xxxv) A.Balasubramaniam – artist, environmentalist, social worker
xxxvi) Roshan Sahi – artist, social worker, naturalist
xxxvii) Prakash Gowda – artist, teacher, nature lover, activist
xxxviii) Jerry – Artist, teacher, social worker, Lake activist
xxxix) Krishnaraj Chonat – Artist, Lake Lover, Social worker
xl) Uday Vir Singh – Artist, Cook, Social Educator, Shaman, Environmentalist
xli) Nithin – artist, permaculture farmer, environmentalist
xlii) Uday Shanbagh – Artist, Naturalist, Nature Lover
xliii) Vishwanath – Artist, Writer, Naturalist
xliv) Dharinee – Drama artist, Gardener, Nature Lover
xlv) Prea Gulatti – teacher, social worker, garden lover
xlvi) Dhanya & John Jacob – art promoters, businessman, social Activist
xlvii) Purna & Himadri – Teacher, Activist, Town Planner, Architect
xlviii) Karun Kumbera – Architect, Social worker

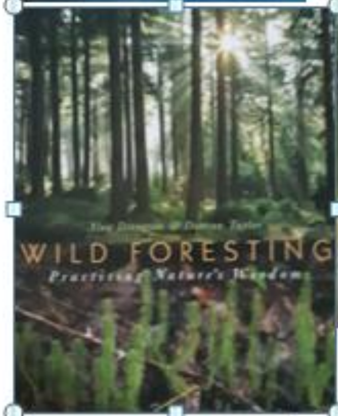
xlix) Meeta Jain - Architect, Social worker
l) Shantala Sudhir – Artist, Teacher, Nature Lover, Activist
li) Mrs. Jyoti Thyagarajan + Ullas B – teachers, activists - Meghshala (for Education to Villages) NGO
lii) Mrs. Ambika – Teacher, Nature Lover, Environmentalist
liii) Ms. Jyotsana – Head of Steiner School, Environmentalist, Activist
liv) Mrs. Anitha Loganadan – Artist, Head of Montessori School, Nature Lover
lv) Mrs. Aparna Desrajurs – teacher, environmentalist, social worker
lvi) Keertana & Konarak Reddy – Musician, Environmentalist, Activist
lvii) Atreyee & Blaise – artists, teachers, social workers, environmentalists
lviii) Bharath Sandur – Plant Expert, Gardener and Nature Lover
lix) Jackson Porretaj – Gardener, Mud House Builder, Teacher, Nature Lover
lx) Priya & Yohan Chandy – Natural Farmers, Environmentalists, Activists
lxi) Nachiappan – Artist, Natural Farmer, Musician
lxii) Suresh Jayaram, 1 Shanti Road Art Residencies – Artist, Teacher, Nature Lover
lxiii) Sangeeta Kadur – artist, tree activist, nature lover
lxiv) Radhakrishnan – Organic Farmer, Teacher, Drama Artist
lxv) AP Chandrashekhar – Organice Farmer, Social Worker
lxvi) Nakul Sahu – Gardener, Businessman, Nature Lover
lxvii) Saleem Hameed – Veterinary Surgeon, Environmentalist, Activist
lxviii) Sandhya Harendra – Nature Tour Guide, Gardener
lxix) Sandhya Gatti – Teacher, Social Worker, Nature Lover
lxx) Ceejo Cyriac – Artist, Environmentalist, Architect
lxxi) Sugatha – Gardener, Naturalist, Activist
lxxii) Yellappa Reddy –Former Under Sec. Environment & Forests, Karnataka –Full Report Handed Over
lxxiii) Almitra Patel – Adviser to Supreme Court on Solid Waste Management
lxxiv) Major BM Appachu – Bird Watcher and enthusiastic supporter of Lakes
lxxv) Bhanu Prakash – Regional Conservator of Forests
lxxvi) Captain Prabhala – Head of Bangalore Environmental Trust NGO
lxxvii) Sannegawdru – Yerepannaly resident, environmentalist & B Engineer, MI Dept, KR Circle
lxxviii) Vijay Kumar – Golahalli resident, youth motivator and activist
lxxix) Dr. Anil Abbi – Hydrologist, consultant & Lake Revival Activist
lxxx) Shiva – Alcoholics Anonymous Councellor, Social Worker, Nature Lover
lxxxi) Usha Shetty – social worker, teacher
lxxxii) Vaishnavi Murthy – designer, diving instructor, nature lover
lxxxiii) Ravi Nayak – Teacher, Gardener, Social Worker
lxxxiv) Jayant Deshpande – Head of Manasa Meditation Center, Nature Lover
lxxxv) Suraj Urs – Congress member, Activist
lxxxvi) Pradeep – BMP Actions, Janagraha contact
lxxxvii) Sudheer Pandey – Artist, Astrologer, Social Activist, RSS & BJP Member –Report Handed Over

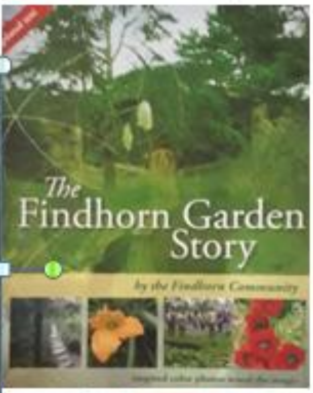

THE WATER WIZARD
The Extraordinary Properties of Natural Water
Viktor Schauberger
Translated and edited by Callum Coats

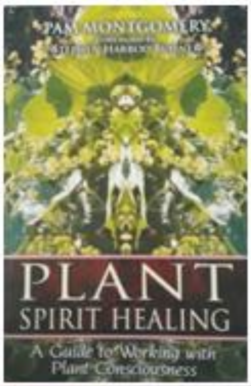

Eager
BEAVERS
MATTER
Ben Goldfarb

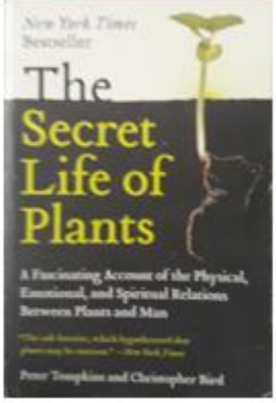

PRINCIPLES OF
ORGANIC FARMING
(with theory and practicals)
E. Somasundaram
D. Udhaya Nandhini
M. Meyyappan

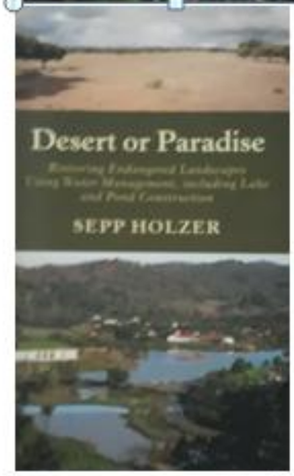

New York Times Bestseller
The Hidden Messages in Water
Masaru Emoto

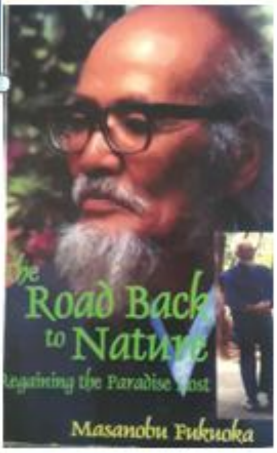

WILD FORESTING
Practising Nature's Wisdom

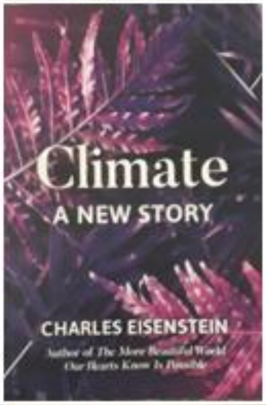

The Findhorn Garden Story
by the Findhorn Community

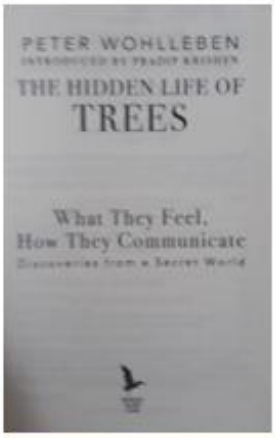

PAM MONTGOMERY
PLANT
SPIRIT HEALING
A Guide to Working with Plant Consciousness


New York Times Bestseller
The Secret Life of Plants
A Fascinating Account of the Physical, Emotional, and Spiritual Relations Between Plants and Man
Peter Tompkins and Christopher Bird


Desert or Paradise
SEPP HOLZER


The Road Back to Nature
Regaining the Paradise Lost
Masanobu Fukuoka

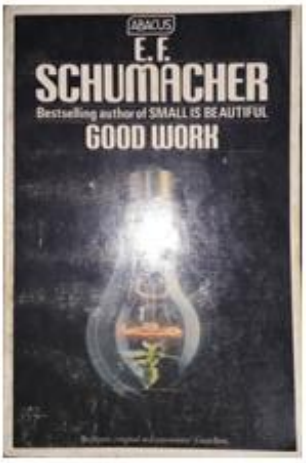

Climate
A NEW STORY
CHARLES EISENSTEIN

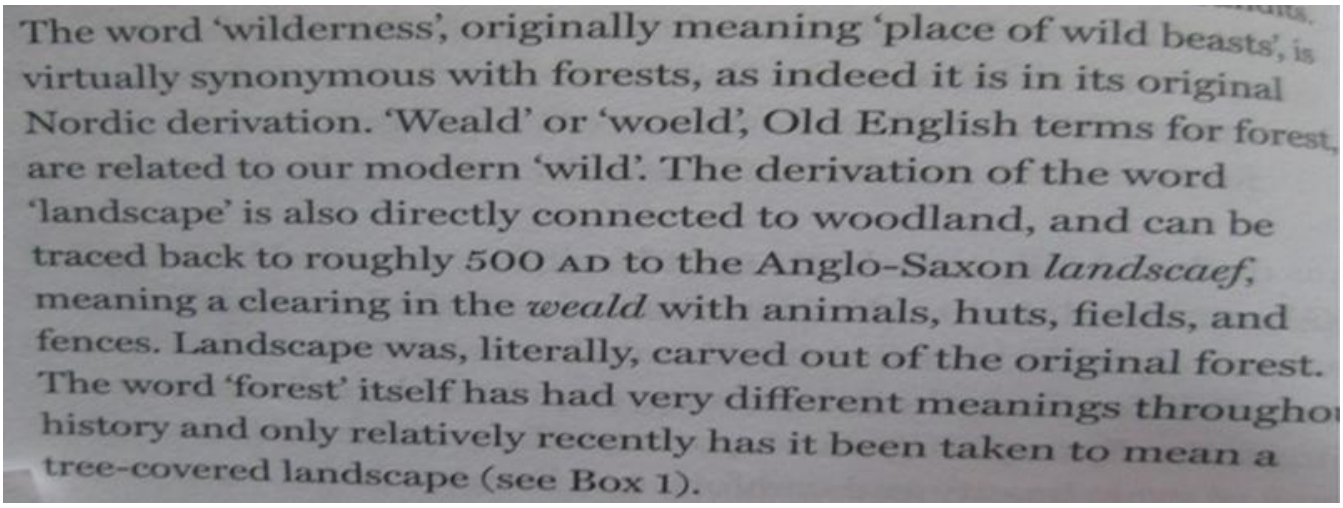

PETER WOHLLEBEN
THE HIDDEN LIFE OF
TREES
What They Feel, How They Communicate
Discoveries from a Secret World

WATER
IN
PLAIN
SIGHT
HOPE FOR A THIRSTY WORLD
JUDITH D. SCHWARTZ

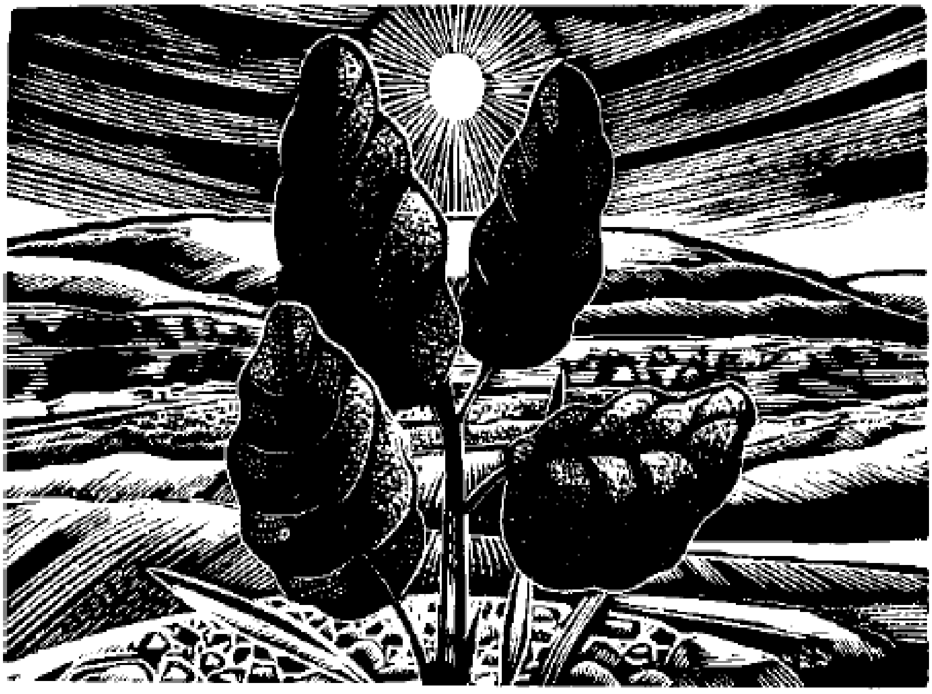
The vision of
Natural farming
Bharat Mansata

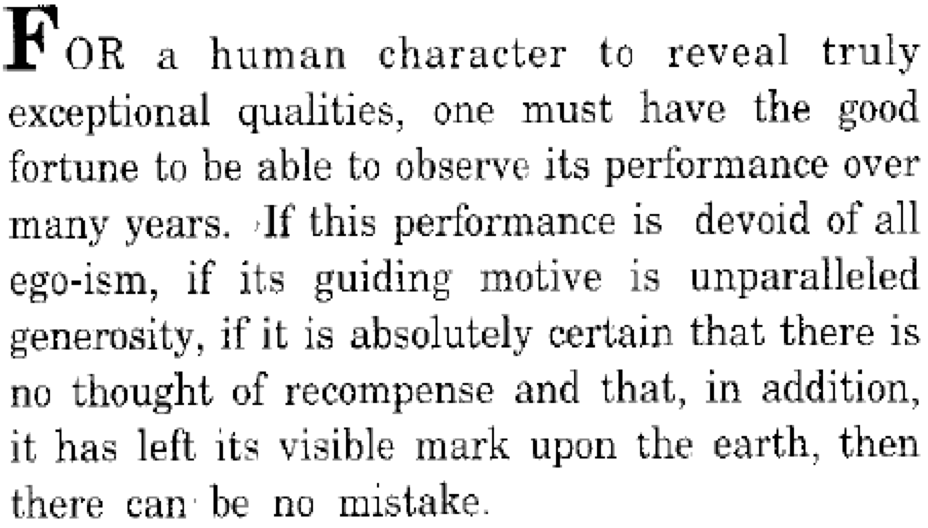
HOLISTIC MANAGEMENT
A COMMONSENSE REVOLUTION TO RESTORE OUR ENVIRONMENT
Allan Savory
with Jody Butterfield


ABACUS
E.F. SCHUMACHER
Bestselling author of SMALL IS BEAUTIFUL
GOOD WORK



The word 'wilderness', originally meaning 'place of wild beasts', is virtually synonymous with forests, as indeed it is in its original Nordic derivation. 'Weald' or 'woeld', Old English terms for forest, are related to our modern 'wild'. The derivation of the word 'landscape' is also directly connected to woodland, and can be traced back to roughly 500 AD to the Anglo-Saxon *landscaef*, meaning a clearing in the *weald* with animals, huts, fields, and fences. Landscape was, literally, carved out of the original forest. The word 'forest' itself has had very different meanings througho history and only relatively recently has it been taken to mean a tree-covered landscape (see Box 1).

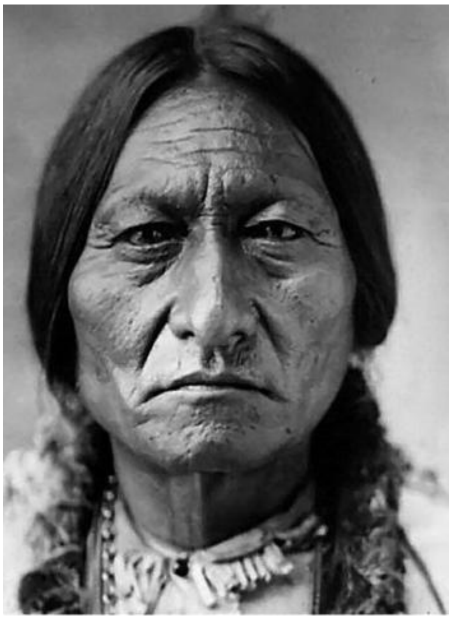


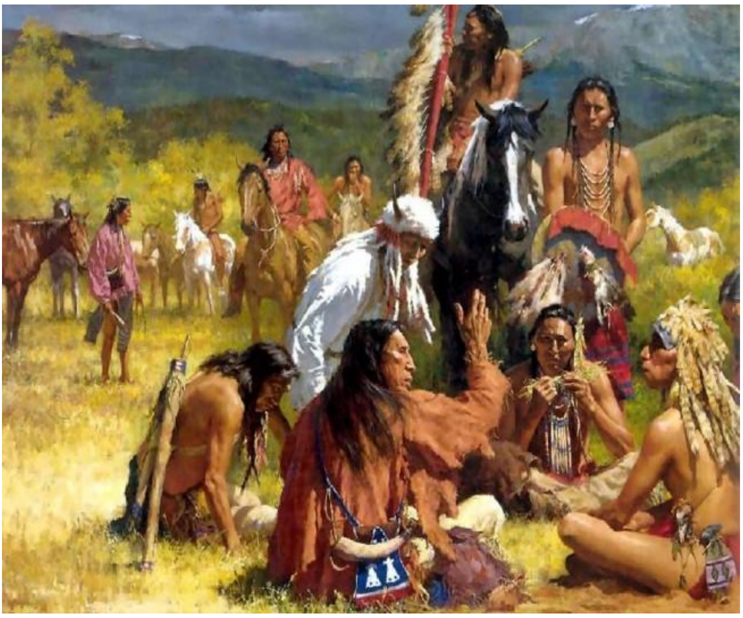


FOR a human character to reveal truly exceptional qualities, one must have the good fortune to be able to observe its performance over many years. If this performance is devoid of all ego-ism, if its guiding motive is unparalleled generosity, if it is absolutely certain that there is no thought of recompense and that, in addition, it has left its visible mark upon the earth, then there can be no mistake.

- Jean Giono

Chief Sitting Bull & a Lakota Sioux Chief Speak on Sacredness of Nature :





4) We did not think of the great open plains, the beautiful rolling hills, the winding streams with tangled growth, as 'wild'. Only to the white man was nature a 'wilderness' and only to him was it 'infested' with 'wild' animals and 'savage' people. To us it was tame. Earth was bountiful and we were surrounded with the blessings of the Great Mystery.

5) With all creatures of the earth, sky and water was a real and active principle. In the animal and bird world there existed a brotherly feeling that kept the Lakota safe among them. And so close did some of the Lakotas come to their feathered and furred friends that in true brotherhood they spoke a common tongue.

6) This concept of life and its relations was humanizing and gave to the Lakota an abiding love. It filled his being with the joy and mystery of living; it gave him reverence for all life; it made a place for all things in the scheme of existence with equal importance to all.

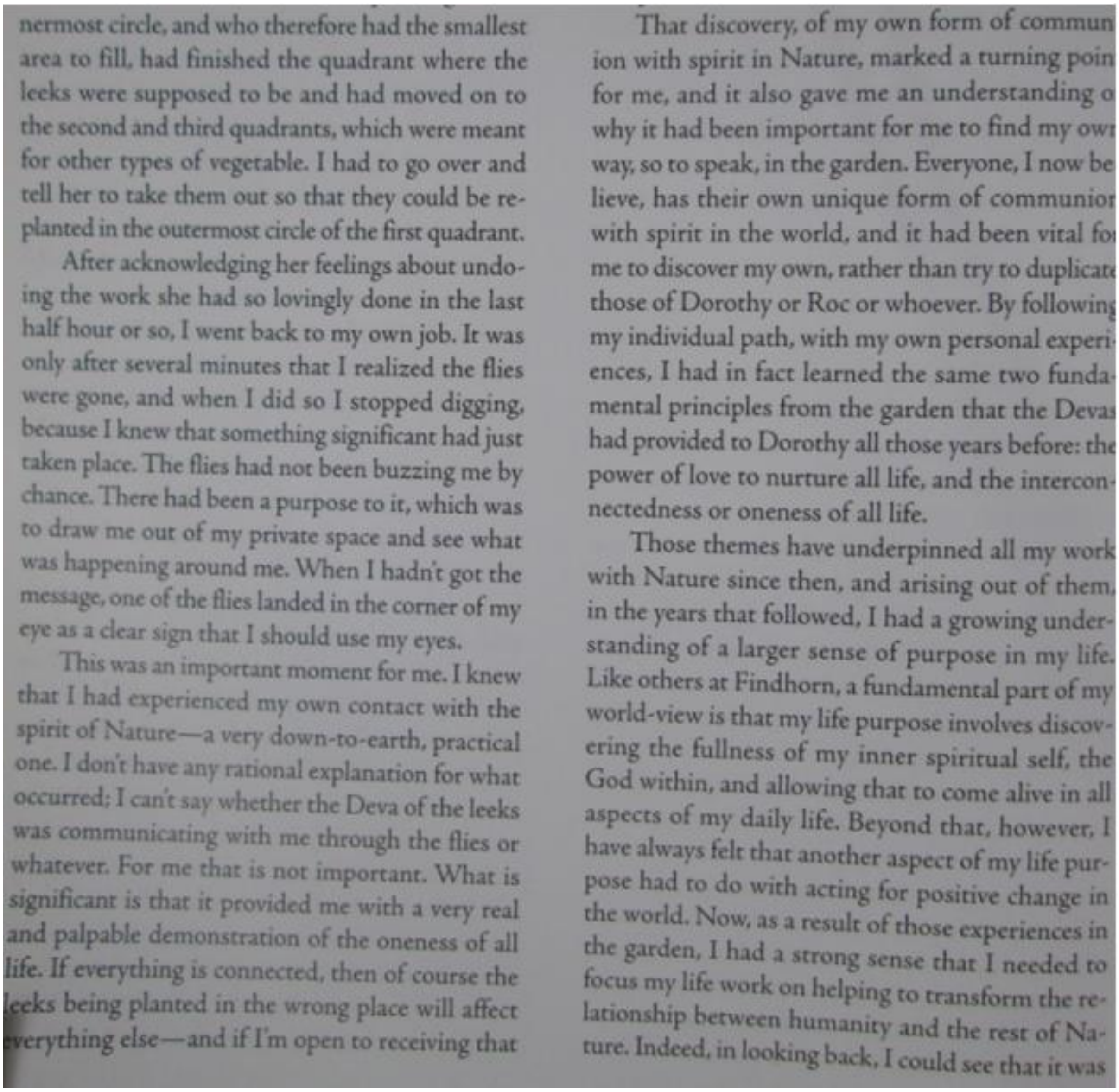
7) It was good for the skin to touch the earth, and the old people liked to remove their moccasins and walk with bare feet on the sacred earth… the old Indian still sits upon the earth instead of propping himself up and away from its life giving forces. For him, to sit or lie upon the ground is to be able to think more deeply and to feel more keenly. He can see more clearly into the mysteries of life and come closer in kinship to other lives about him.

8) Everything was possessed of personality, only differing from us in form. Knowledge was inherent in all things. The world was a library and its books were the stones, leaves, grass, brooks, and the birds and animals that shared, alike with us, the storms and blessings of earth. We learned to do what only the student of nature learns, and that was to feel beauty. We never railed at the storms, the furious winds, and the biting frosts and snows. To do so intensified human futility, so whatever came we adjusted ourselves, by more effort and energy if necessary, but without complaint.

9) …the old Lakota was wise. He knew that a man’s heart, away from nature, becomes hard; he knew that lack of respect for growing, living things soon led to lack of respect for humans, too. So he kept his children close to nature’s softening influence.

10) Civilization has been thrust upon me… and it has not added one whit to my love for truth, honesty, and generosity.

“The Great Spirit,” he continued, “also gave our Indigenous peoples and all other peoples who live close **to Mother Earth**, both **wisdom and knowledge** through dreams, visions, fasting, and prayer, and the **ability to see the lessons the Creator has put in every part of creation**. **Look at those trees standing** over there; the alder does not tell the pine tree to move over, the pine does not tell the fir tree to move over, each tree stands **together in unity**, their mouths pressed toward the same Mother Earth, refreshed by the same **breeze**, warmed by the same **sun**, with their arms upraised in prayer and **thanksgiving, protecting** one another. **If we are to have peace and true freedom in the world,” he said, “we too must learn to live like those trees.** Look, grandson, at the **beautiful teachings** the Creator has put in the little **stream**. Feel the water and see how **gently and lovingly** it touches your hands. It travels through **deserts, mountains**, and many places, & it **never turns its back** on anyone or anything. Even though it **gives life to all** living things, it is **very humble**, for it always seeks the very lowest spot. But it **has great faith, power, and patience** for even if a mountain stands in it’s path, it **keeps moving** and moving until finally that mountain is washed into the sea and is no more. These are **spiritual gifts** that the Creator has given each one of us and if we are **to be happy within ourselves and with one another, and find true freedom**, we too must develop these sacred gifts,” he concluded.



nermost circle, and who therefore had the smallest area to fill, had finished the quadrant where the leeks were supposed to be and had moved on to the second and third quadrants, which were meant for other types of vegetable. I had to go over and tell her to take them out so that they could be replanted in the outermost circle of the first quadrant.

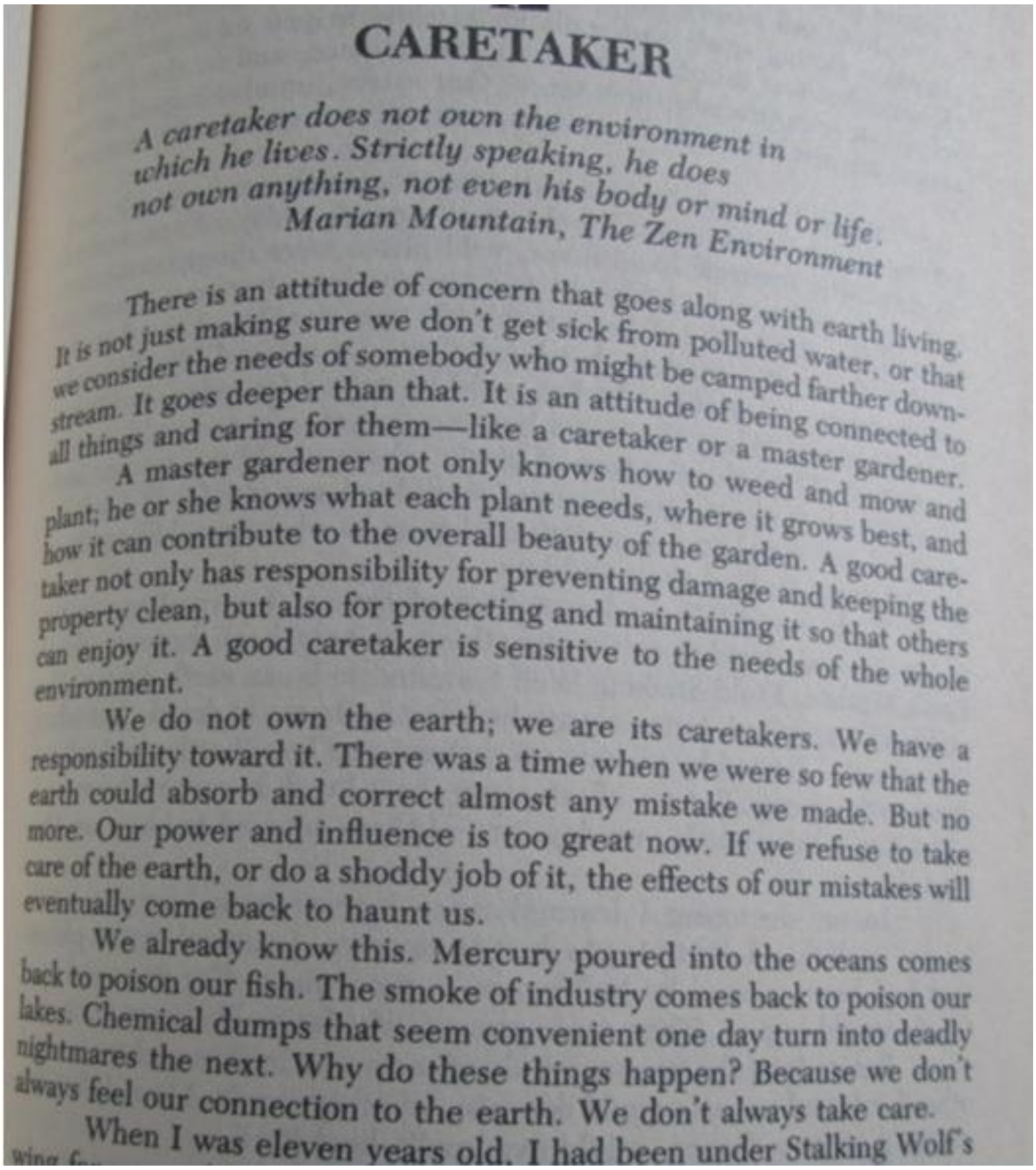
After acknowledging her feelings about undoing the work she had so lovingly done in the last half hour or so, I went back to my own job. It was only after several minutes that I realized the flies were gone, and when I did so I stopped digging, because I knew that something significant had just taken place. The flies had not been buzzing me by chance. There had been a purpose to it, which was to draw me out of my private space and see what was happening around me. When I hadn't got the message, one of the flies landed in the corner of my eye as a clear sign that I should use my eyes.

This was an important moment for me. I knew that I had experienced my own contact with the spirit of Nature—a very down-to-earth, practical one. I don't have any rational explanation for what occurred; I can't say whether the Deva of the leeks was communicating with me through the flies or whatever. For me that is not important. What is significant is that it provided me with a very real and palpable demonstration of the oneness of all life. If everything is connected, then of course the leeks being planted in the wrong place will affect everything else—and if I'm open to receiving that

That discovery, of my own form of communion with spirit in Nature, marked a turning poin for me, and it also gave me an understanding o why it had been important for me to find my own way, so to speak, in the garden. Everyone, I now believe, has their own unique form of communion with spirit in the world, and it had been vital fo me to discover my own, rather than try to duplicate those of Dorothy or Roc or whoever. By following my individual path, with my own personal experiences, I had in fact learned the same two fundamental principles from the garden that the Devas had provided to Dorothy all those years before: the power of love to nurture all life, and the interconnectedness or oneness of all life.

Those themes have underpinned all my work with Nature since then, and arising out of them, in the years that followed, I had a growing understanding of a larger sense of purpose in my life. Like others at Findhorn, a fundamental part of my world-view is that my life purpose involves discovering the fullness of my inner spiritual self, the God within, and allowing that to come alive in all aspects of my daily life. Beyond that, however, I have always felt that another aspect of my life purpose had to do with acting for positive change in the world. Now, as a result of those experiences in the garden, I had a strong sense that I needed to focus my life work on helping to transform the relationship between humanity and the rest of Nature. Indeed, in looking back, I could see that it was

- **Findhorn Gardens, Scotland**



CARETAKER

> *A caretaker does not own the environment in which he lives. Strictly speaking, he does not own anything, not even his body or mind or life.*
> Marian Mountain, *The Zen Environment*

There is an attitude of concern that goes along with earth living. It is not just making sure we don't get sick from polluted water, or that we consider the needs of somebody who might be camped farther downstream. It goes deeper than that. It is an attitude of being connected to all things and caring for them—like a caretaker or a master gardener.

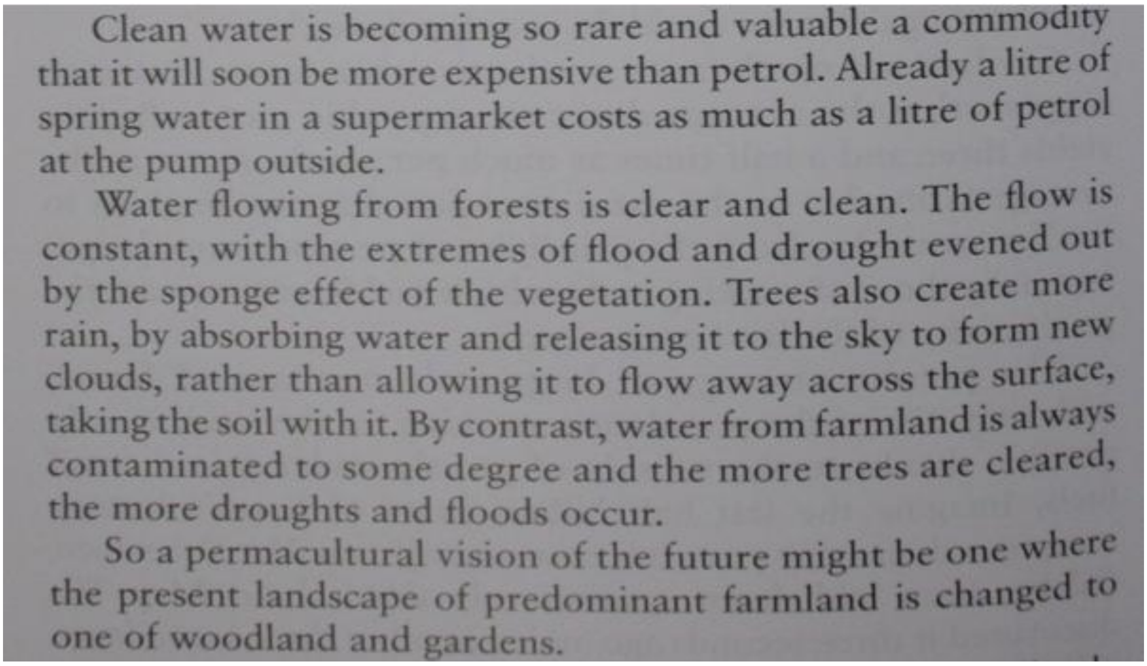
A master gardener not only knows how to weed and mow and plant; he or she knows what each plant needs, where it grows best, and how it can contribute to the overall beauty of the garden. A good caretaker not only has responsibility for preventing damage and keeping the property clean, but also for protecting and maintaining it so that others can enjoy it. A good caretaker is sensitive to the needs of the whole environment.

We do not own the earth; we are its caretakers. We have a responsibility toward it. There was a time when we were so few that the earth could absorb and correct almost any mistake we made. But no more. Our power and influence is too great now. If we refuse to take care of the earth, or do a shoddy job of it, the effects of our mistakes will eventually come back to haunt us.

We already know this. Mercury poured into the oceans comes back to poison our fish. The smoke of industry comes back to poison our lakes. Chemical dumps that seem convenient one day turn into deadly nightmares the next. Why do these things happen? Because we don't always feel our connection to the earth. We don't always take care.

When I was eleven years old, I had been under Stalking Wolf's

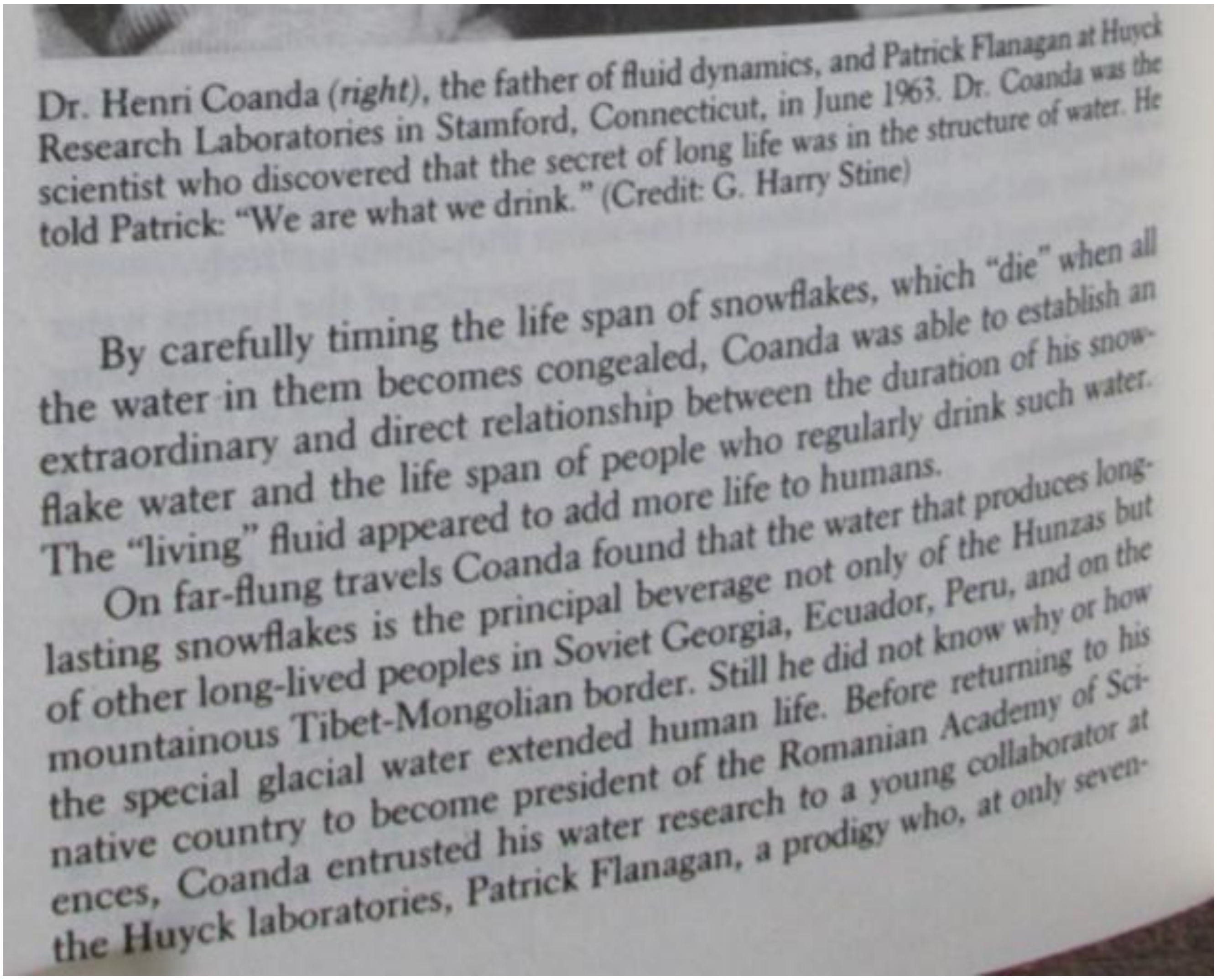
- **Stalking Wolf,** *free* Apache Indian **Grandfather**



Clean water is becoming so rare and valuable a commodity that it will soon be more expensive than petrol. Already a litre of spring water in a supermarket costs as much as a litre of petrol at the pump outside.

Water flowing from forests is clear and clean. The flow is constant, with the extremes of flood and drought evened out by the sponge effect of the vegetation. Trees also create more rain, by absorbing water and releasing it to the sky to form new clouds, rather than allowing it to flow away across the surface, taking the soil with it. By contrast, water from farmland is always contaminated to some degree and the more trees are cleared, the more droughts and floods occur.

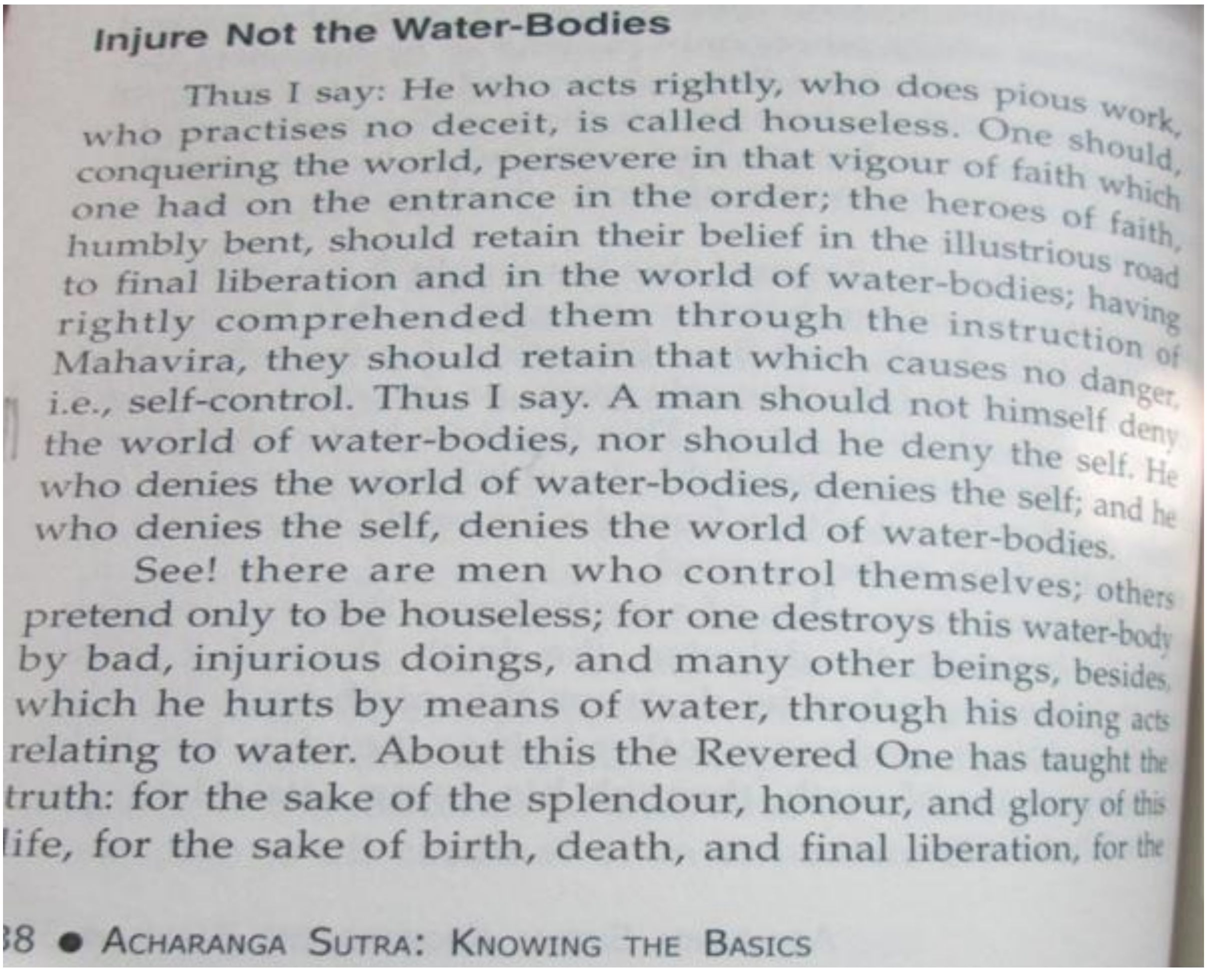
So a permacultural vision of the future might be one where the present landscape of predominant farmland is changed to one of woodland and gardens.



Dr. Henri Coanda (*right*), the father of fluid dynamics, and Patrick Flanagan at Huyck Research Laboratories in Stamford, Connecticut, in June 1963. Dr. Coanda was the scientist who discovered that the secret of long life was in the structure of water. He told Patrick: "We are what we drink." (Credit: G. Harry Stine)

By carefully timing the life span of snowflakes, which "die" when all the water in them becomes congealed, Coanda was able to establish an extraordinary and direct relationship between the duration of his snowflake water and the life span of people who regularly drink such water. The "living" fluid appeared to add more life to humans.

On far-flung travels Coanda found that the water that produces long-lasting snowflakes is the principal beverage not only of the Hunzas but of other long-lived peoples in Soviet Georgia, Ecuador, Peru, and on the mountainous Tibet-Mongolian border. Still he did not know why or how the special glacial water extended human life. Before returning to his native country to become president of the Romanian Academy of Sciences, Coanda entrusted his water research to a young collaborator at the Huyck laboratories, Patrick Flanagan, a prodigy who, at only seven-



Injure Not the Water-Bodies

Thus I say: He who acts rightly, who does pious work, who practises no deceit, is called houseless. One should, conquering the world, persevere in that vigour of faith which one had on the entrance in the order; the heroes of faith, humbly bent, should retain their belief in the illustrious road to final liberation and in the world of water-bodies; having rightly comprehended them through the instruction of Mahavira, they should retain that which causes no danger, i.e., self-control. Thus I say. A man should not himself deny the world of water-bodies, nor should he deny the self. He who denies the world of water-bodies, denies the self; and he who denies the self, denies the world of water-bodies.

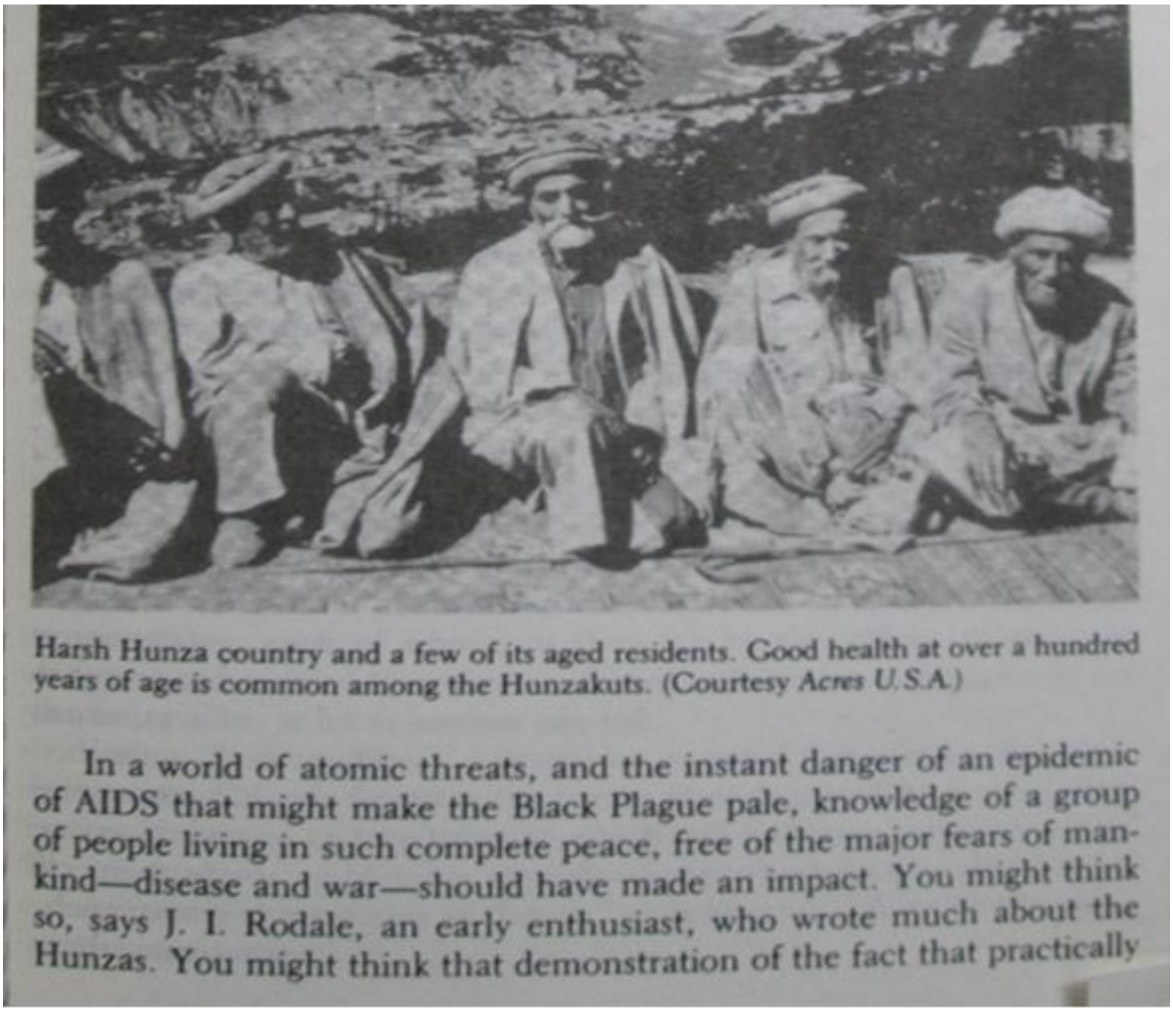
See! there are men who control themselves; others pretend only to be houseless; for one destroys this water-body by bad, injurious doings, and many other beings, besides, which he hurts by means of water, through his doing acts relating to water. About this the Revered One has taught the truth: for the sake of the splendour, honour, and glory of this life, for the sake of birth, death, and final liberation, for the

38 ● ACHARANGA SUTRA: KNOWING THE BASICS

About Pat McCabe

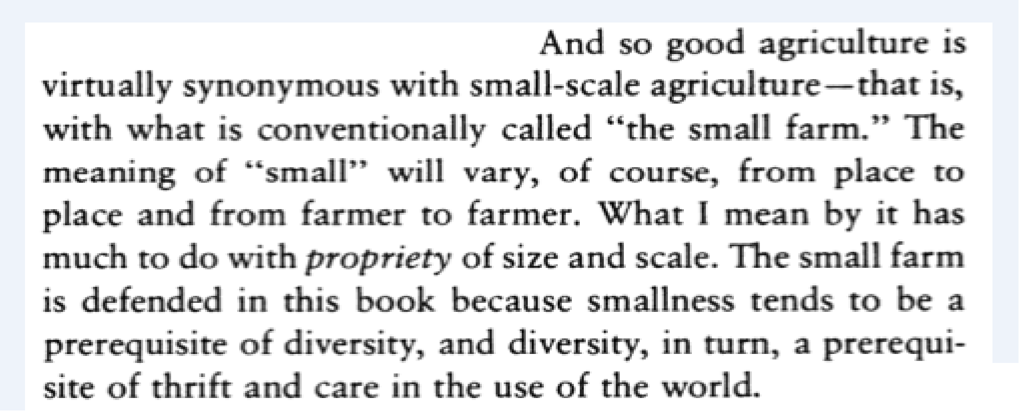
Woman Stands Shining, Pat McCabe, has the honour of being of the Dine (Navajo) Nation. She brings the understanding of Indigenous ways of knowing into discussion and inquiry on Sustainability. She carries the foundation of Beauty and Spirit into places where it has been kept out. Pat is an active participant in Indigenous Peoples gatherings worldwide including Chile, Belgium, Ecuador, Peru, Mexico and Bali. She has worked with the International Center for Cultural Studies in India and with Sarvodaya with Dr. A.T. Ariyaratne in Sri Lanka, as well as with organizations and gatherings in the U.S. She has been a cultural consultant to the Pachamama Alliance, presenting at the 2013and 2014 National Bioneers Conference, and presenting on "The Feminine Design and Sustainability" in the U.S. and Internationally.

She first came to the UK in 2014, as an invited guest to the New Story Summit at Findhorn Community, Scotland. She also visited Devon that year, and returned to lead sessions of the Becoming Indigenous course at Schumacher College in 2015. https://thrivinglife.weebly.com/



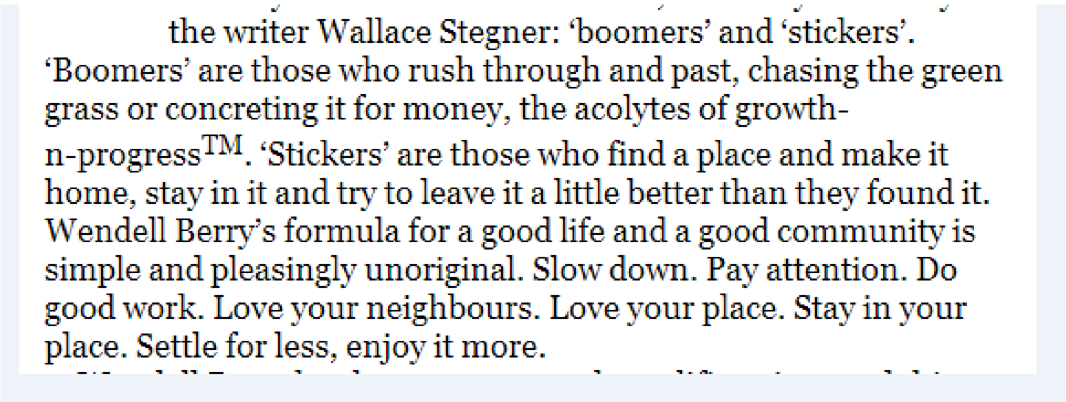
Harsh Hunza country and a few of its aged residents. Good health at over a hundred years of age is common among the Hunzakuts. (Courtesy *Acres U.S.A.*)

In a world of atomic threats, and the instant danger of an epidemic of AIDS that might make the Black Plague pale, knowledge of a group of people living in such complete peace, free of the major fears of mankind—disease and war—should have made an impact. You might think so, says J. I. Rodale, an early enthusiast, who wrote much about the Hunzas. You might think that demonstration of the fact that practically

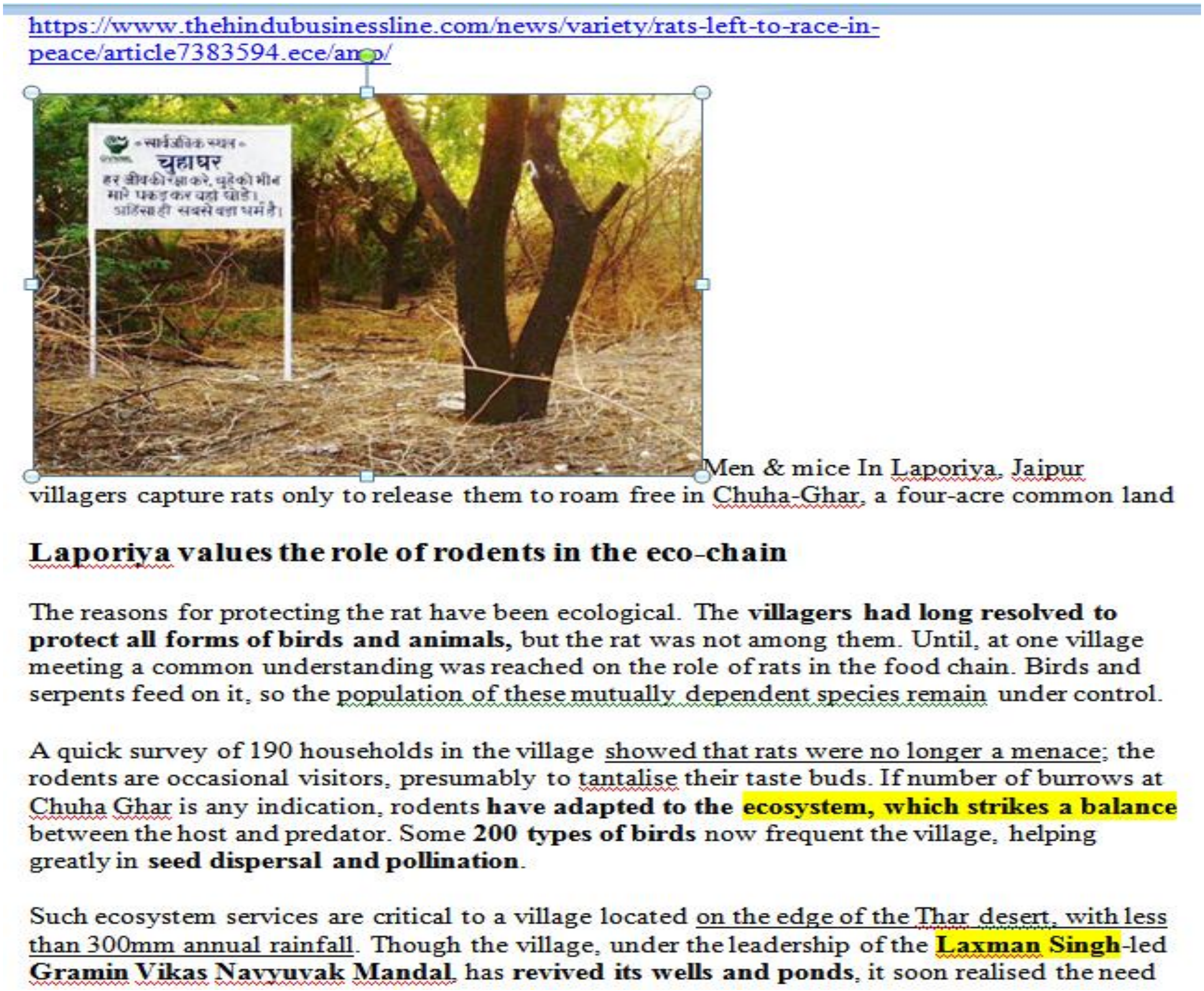


And so good agriculture is virtually synonymous with small-scale agriculture—that is, with what is conventionally called "the small farm." The meaning of "small" will vary, of course, from place to place and from farmer to farmer. What I mean by it has much to do with *propriety* of size and scale. The small farm is defended in this book because smallness tends to be a prerequisite of diversity, and diversity, in turn, a prerequisite of thrift and care in the use of the world.

. . .



the writer Wallace Stegner: 'boomers' and 'stickers'. 'Boomers' are those who rush through and past, chasing the green grass or concreting it for money, the acolytes of growth-n-progress^{TM}. 'Stickers' are those who find a place and make it home, stay in it and try to leave it a little better than they found it. Wendell Berry's formula for a good life and a good community is simple and pleasingly unoriginal. Slow down. Pay attention. Do good work. Love your neighbours. Love your place. Stay in your place. Settle for less, enjoy it more.



सार्वजनिक स्थल
चुहाघर
हर जीव की रक्षा करे, चूहे को मत मारे पकड़ कर यहां छोड़े।
अहिंसा ही सबसे बड़ा धर्म है।

https://www.thehindubusinessline.com/news/variety/rats-left-to-race-in-peace/article7383594.ece/amp/

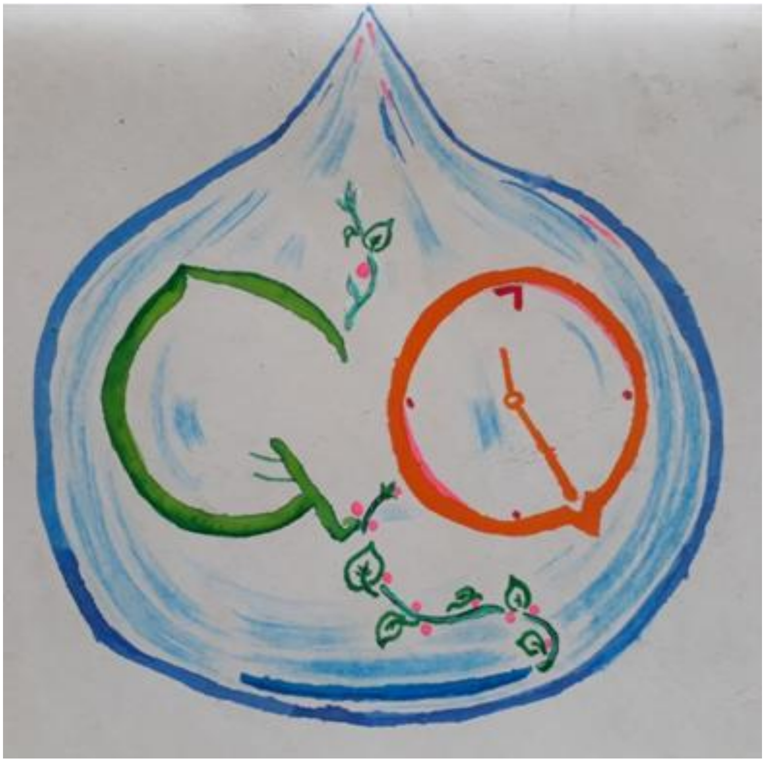
Men & mice In Laporiya, Jaipur villagers capture rats only to release them to roam free in Chuha-Ghar, a four-acre common land

Laporiya values the role of rodents in the eco-chain

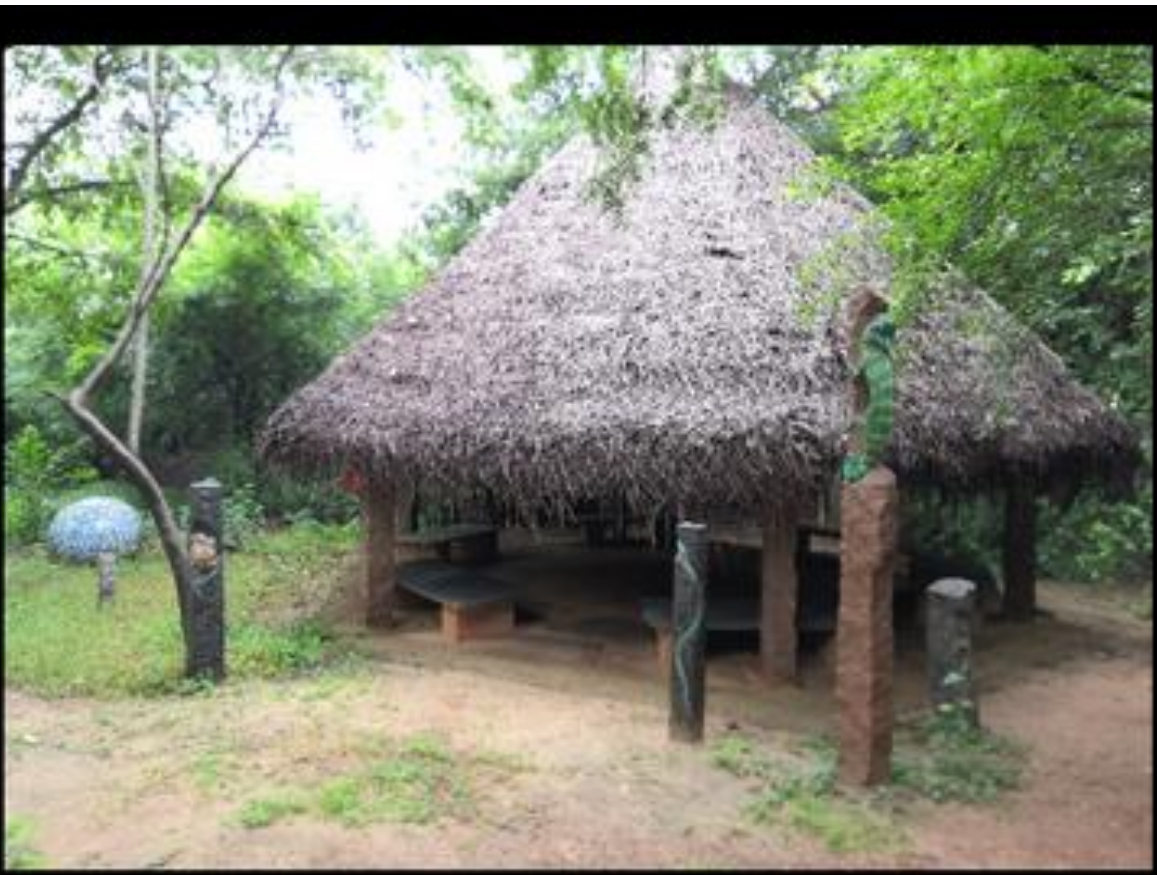
The reasons for protecting the rat have been ecological. The **villagers had long resolved to protect all forms of birds and animals,** but the rat was not among them. Until, at one village meeting a common understanding was reached on the role of rats in the food chain. Birds and serpents feed on it, so the population of these mutually dependent species remain under control.

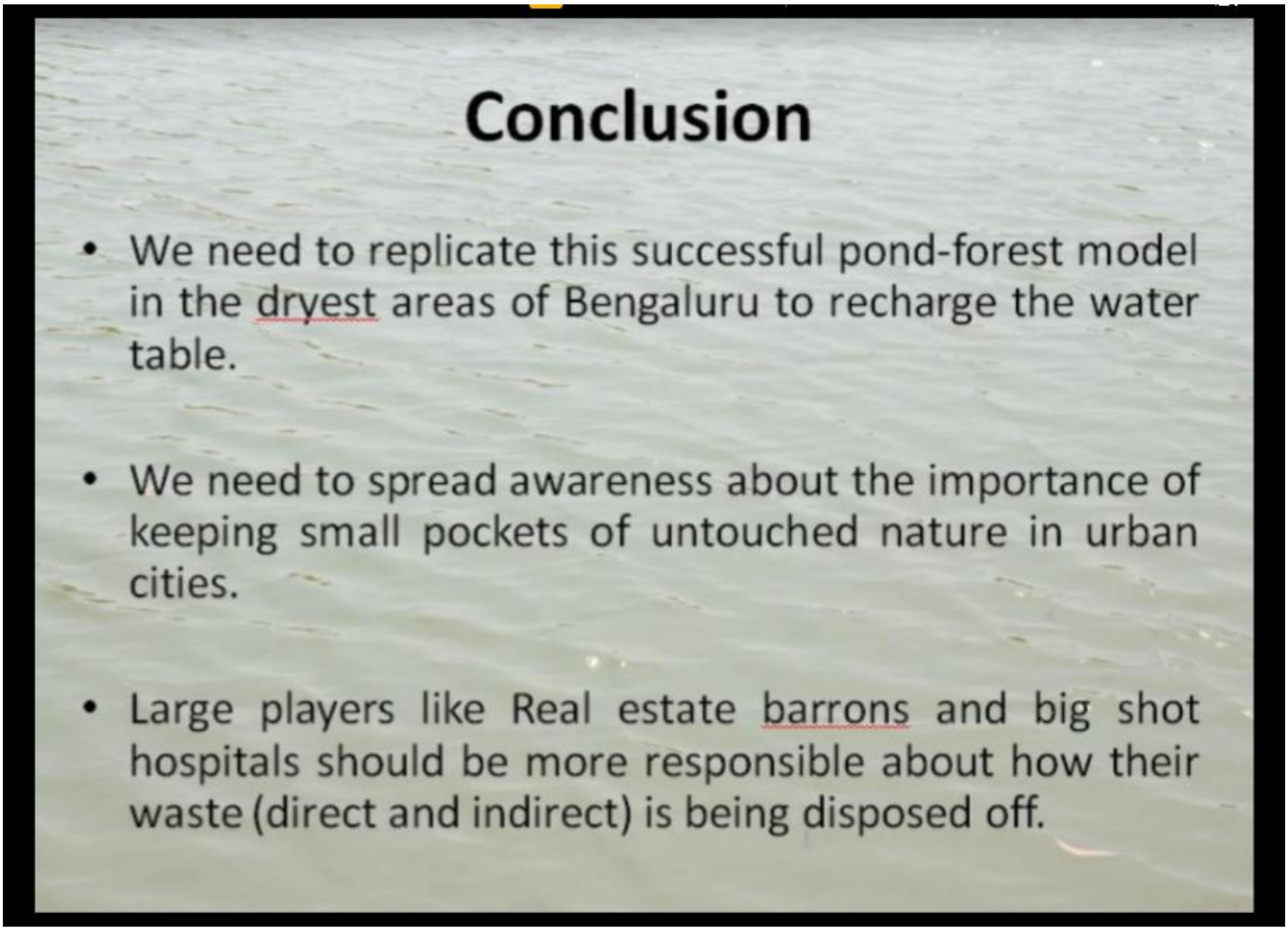
A quick survey of 190 households in the village showed that rats were no longer a menace; the rodents are occasional visitors, presumably to tantalise their taste buds. If number of burrows at Chuha Ghar is any indication, rodents **have adapted to the ecosystem, which strikes a balance** between the host and predator. Some **200 types of birds** now frequent the village, helping greatly in **seed dispersal and pollination**.

Such ecosystem services are critical to a village located on the edge of the Thar desert, with less than 300mm annual rainfall. Though the village, under the leadership of the **Laxman Singh**-led **Gramin Vikas Navyuvak Mandal**, has **revived its wells and ponds**, it soon realised the need



Proposed Creative Design Features :





Conclusion

- We need to replicate this successful pond-forest model in the dryest areas of Bengaluru to recharge the water table.
- We need to spread awareness about the importance of keeping small pockets of untouched nature in urban cities.
- Large players like Real estate barrons and big shot hospitals should be more responsible about how their waste (direct and indirect) is being disposed off.

GoodEarth
building sustainable communities

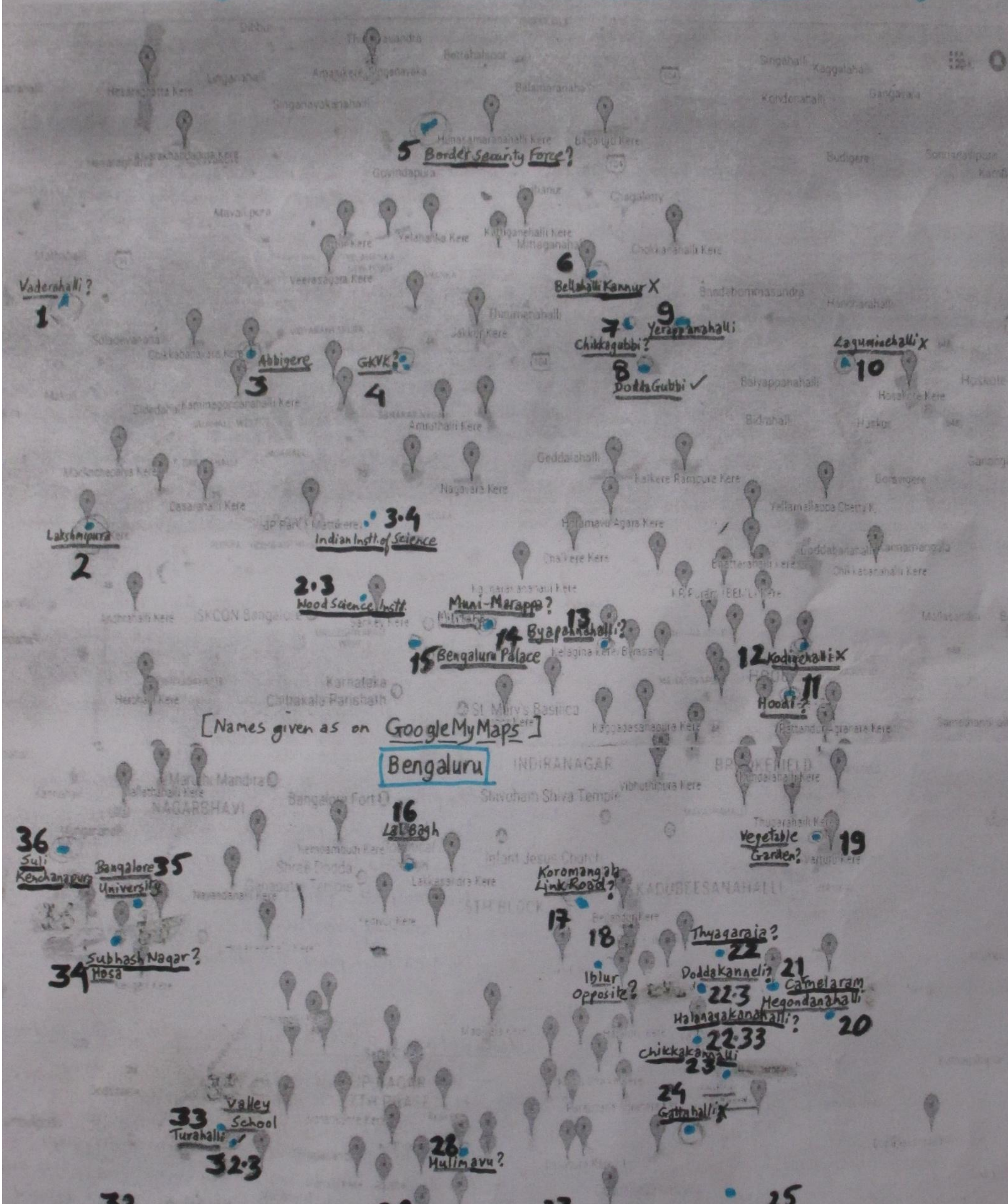
Stanley George
& Ravi Shah

Thank You

No Green, No Blue……………. No Water, No Life

Spongy Grasslands for maximum storage of water and rainwater harvesting.

Locating the last Savable Oases of Wild Nature in Bangalore


5 Border Security Force?
6 Bellahalli Kannur X
Vaderahalli? 1
9 Yerappanahalli
7 Chikkagubbi?
8 DoddaGubbi ✓
Laguminahalli X 10
Abbigere 3
GKVK? 4
Lakshmipura 2
3·4 Indian Instt. of Science
2·3 Wood Science Instt.
Muni-Marappa?
13 Byapanahalli?
14
15 Bengaluru Palace
12 Kodigehalli X
11 Hoodi?
Bengaluru
INDIRANAGAR
BROOKEFIELD
NAGARBHAVI
16 Lal Bagh
36 Suli Kenchanapura
Bangalore University 35
Koromangala Link Road?
19 Vegetable Garden?
17
18
Thyagaraja? 22
21
Doddakanneli?
Camelaram
22·3
Hegondanahalli
Iblur Opposite?
Halanayakanahalli?
20
22·33
Chikkakanahalli
23
24
Gattahalli X
34 Subhash Nagar? Hosa
33 Valley School
Turahalli
32·3
28 Hulimavu?
32 Agara?
31·2 Thathaguni
31 Vedherahalli?
29 Gottigere?
27 Vittasandra
Naarayanaghatta 25
Muthanalur 26
30 Bannerghatta Park

[Names given as on GoogleMyMaps]

List of **Sacred Oases** of Life in Bangalore, 2017

? 1. Alur Lake, Vaderahalli
2. Laxmipura Lake, KG Srikantapura
2.3 Wood Science Institute
3 Abbigere Lake
✓ 3.4 Indian Institute of Science
? 4. Gandhiji Krishi Vidya Kendra
? 5 Border Security Force, Suggatta (Military)
✗ 6 Belahalli Lake, Kannuru
? 7 Chikkagubbi Lake
✓ 8. Doddagubbi Lake, west side <SUCCESFUL NATURAL REVIVAL!> [by Ravi Shah 97388-38573 axeravi@gmail]
9. Yerappanahalli Lake
✗ 10. Laguminehalli
? 11. Hoodi Road Lake, Ayyappanagar
✗ 12 Kodigehalli-Sadaramangala Lake
? 13 B(ai)yappanahalli Lake,Kathalipalya (Military)
? 14. Muni-marappa Garden (Military)
✓ 15. Palace Grounds (Royal Family)
16. South Pond, LalBagh, Siddapura
? 17. Koromangala Ring Road (Military)
? 18. Opposite Iblur (Military)
? 19. Vegetable Garden, north side of Varthur Lake
20. Hegondanahalli
21. Carmelaram Lake, Doddakannelli Road
? 22 Thyagaraja Layout
? 22.3 Doddakanneli Lake
? 22.3 Halanayakanahalli Lake
23. Chikkakannalli Lake
✗ 24. Gattahalli
25. Narayanaghatta Lake, Chintala Madivala
26. Muthanallur Lake, Ramasagara
27. Vittasandra Lake
? 28. Hulimavu Lake
? 29. Kammanahalli-Meenakshi Lake, Gottigere
✓ 30 Bannerghatta National Park
? 31 Vedherahalli-OB Chudanahalli Lake (Roerich's)
31.2 Thathaguni Pond
? 32. Agara Lake, Thathaguni
32.3 Turahalli Forest
✓ 33. theValley School Pond
? 34. Hosa Lake, Subhash Nagar, Kengeri
35. Bangalore University
36. Suli Lake, Kenchanapura

(already in one year some of these ponds have been compromised X & many are doubtful?)
<only a few ✓ are still pretty wild & pristine>
[military areas are doubtful as authorisation is required]

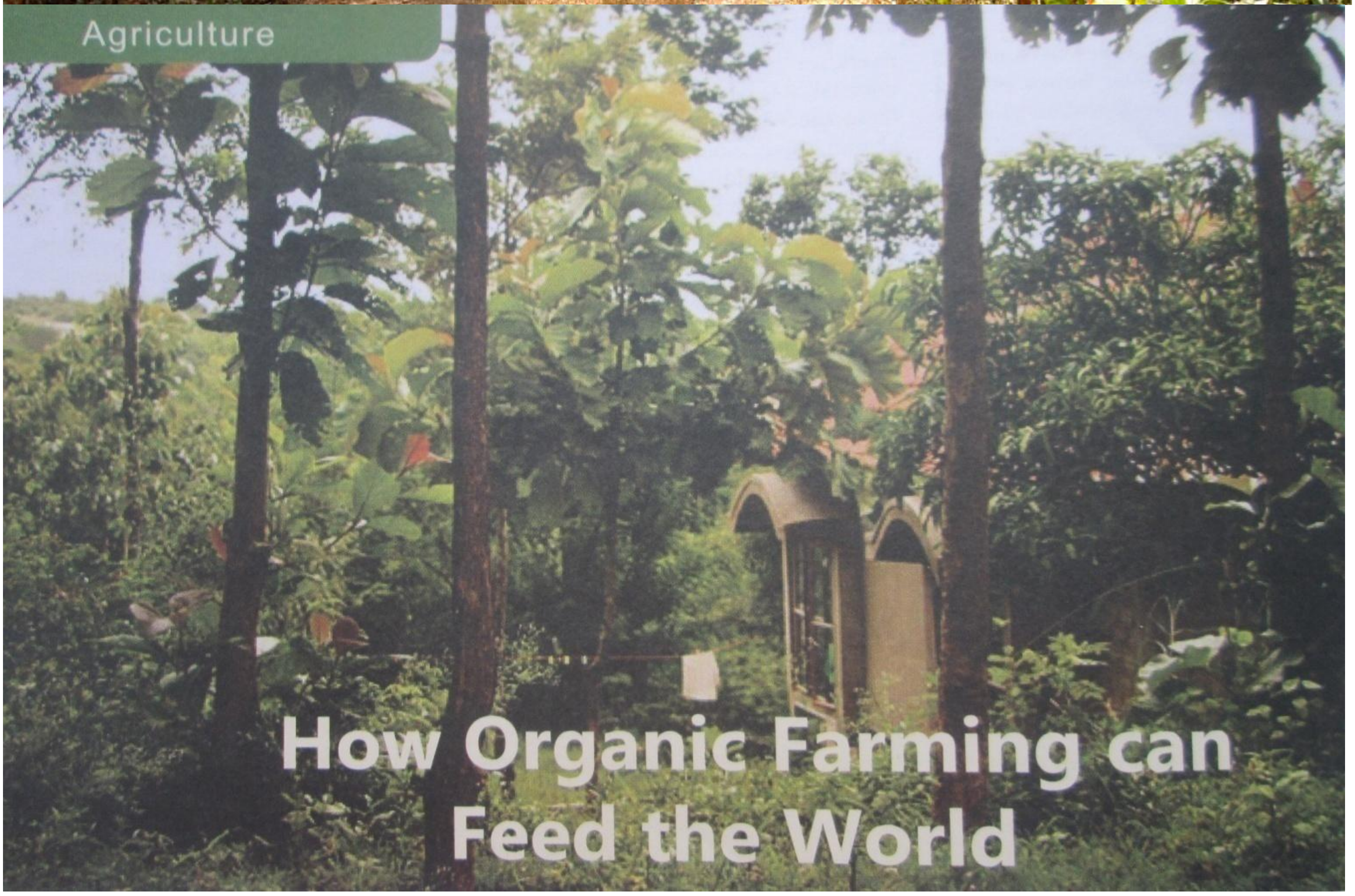
Minimum Requirements to Protect the Oases

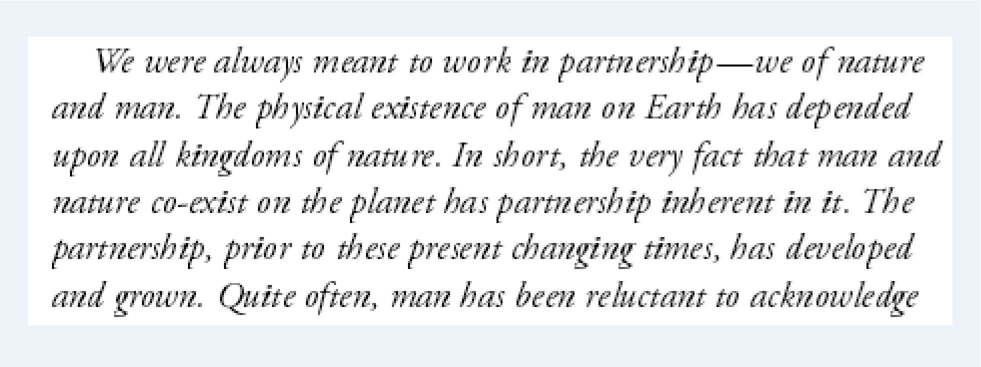
- Atleast one caring person to regularly visit
- Making locals aware of importance of oases
- Simple fencing if there are too many vandals
- Cow grazing limited & Sheep/Goats Banned!
- Fishing, Hunting, Fire-Wood Gathering all Banned!
- Local children to clean area & plant saplings
- Simple Poojas on fullmoon days with some dance
- Mudembankment to keep sewage & lake water out
- Stone-Walling on the outside of embankment
- Where it is not an island, dig trenches to keep out lorries
- Put up sign boards with instructions
- Explain to Dons the cost benefits in long term
- Document the process to share on global platform
- Snakes to be rehabilitated here
- No footpaths, parks, nurseries, tanks, seats in vicinity
- No walking, boating, photography - no entry at all!
- No treatment plant, storage tank or any concrete in vicinity

Advantages of Wild Jungle Oases (only totally wild ones)

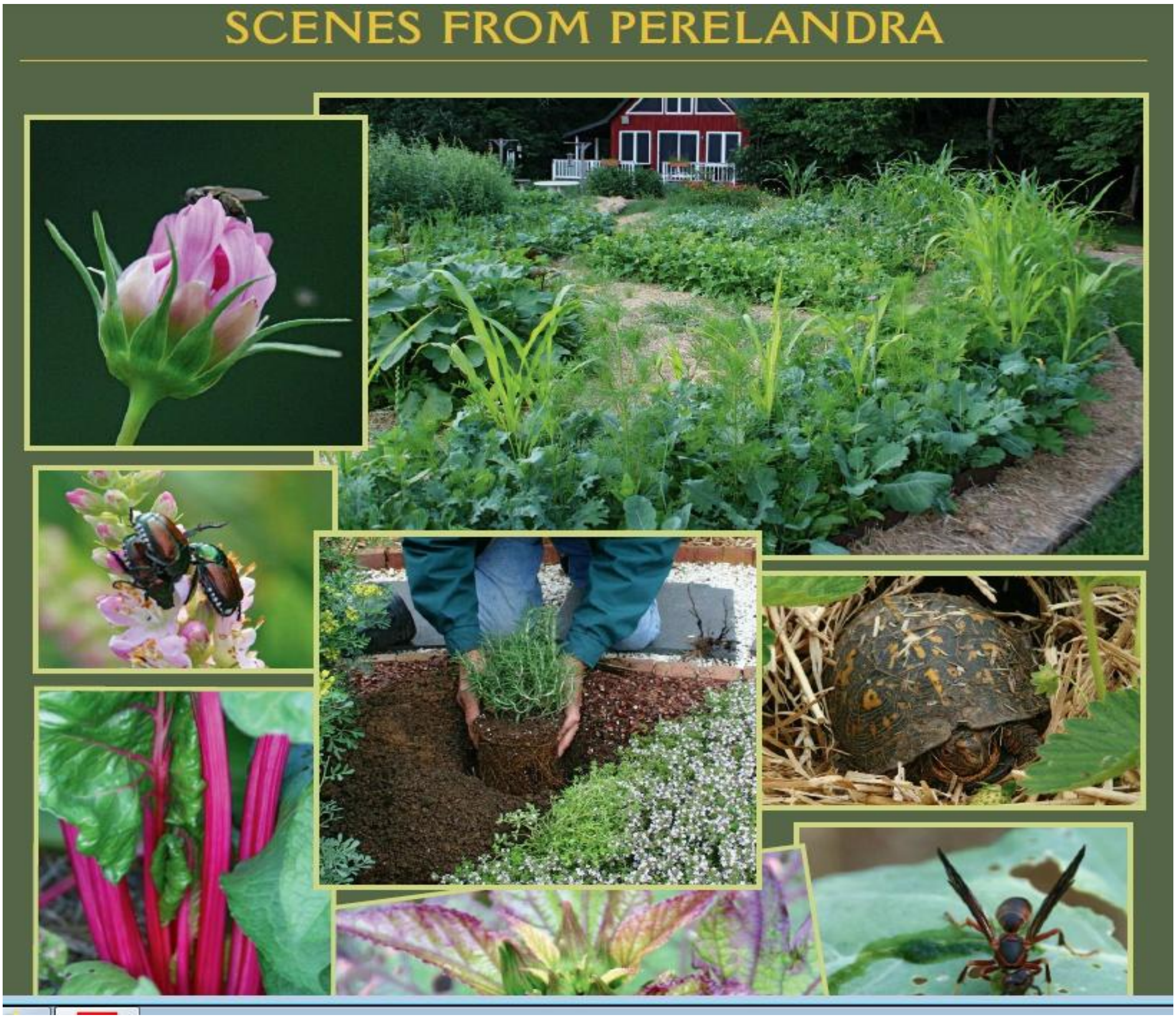
- they pump/suck up ground water to surface
- they attract rain bearing clouds
- they absorb 80% of rainfall & store it for months
- the wild pond never dries up, every raindrop adds!
- bio diversity will be higher than in national parks even
- atmosphere will be purified for kilometers around
- ambient Temperatures will be much more amiable
- surrounding vegetation & farms will be supported for tens of km
- in times of famine a lot of food could be sourced here
- they are rich in medicinal native herb species
- the pond water quality will be better than the lakes!

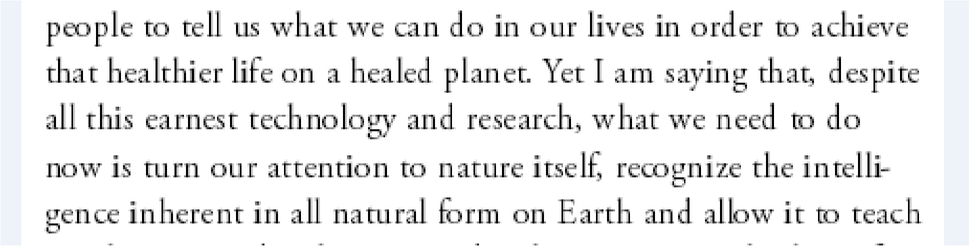
Welcome !
AIKANTHIKA
Natural Farming and Living Center
Handbook


Agriculture
How Organic Farming can
Feed the World



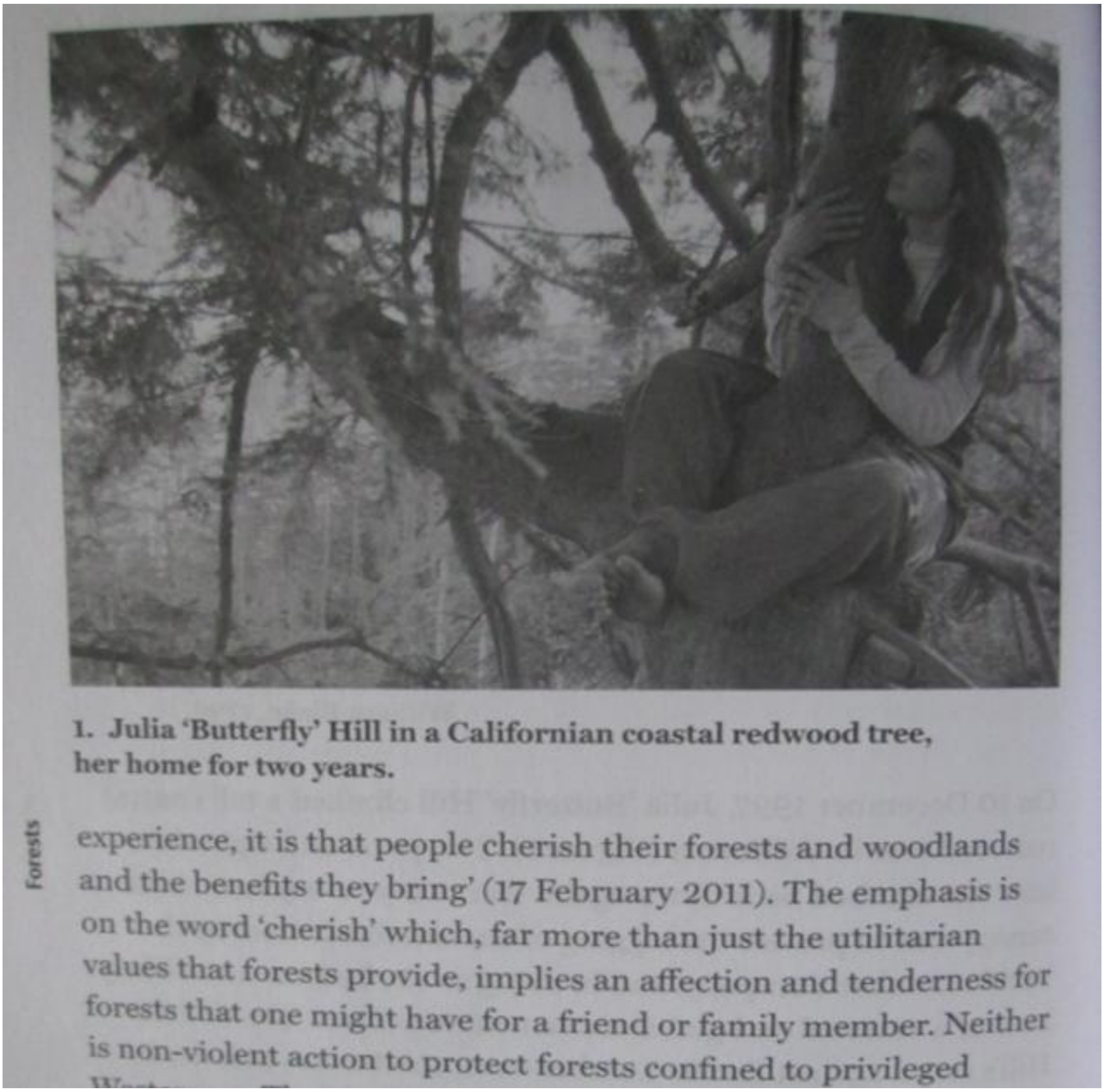
We were always meant to work in partnership—we of nature and man. The physical existence of man on Earth has depended upon all kingdoms of nature. In short, the very fact that man and nature co-exist on the planet has partnership inherent in it. The partnership, prior to these present changing times, has developed and grown. Quite often, man has been reluctant to acknowledge





people to tell us what we can do in our lives in order to achieve that healthier life on a healed planet. Yet I am saying that, despite all this earnest technology and research, what we need to do now is turn our attention to nature itself, recognize the intelligence inherent in all natural form on Earth and allow it to teach

Machaelle Wright

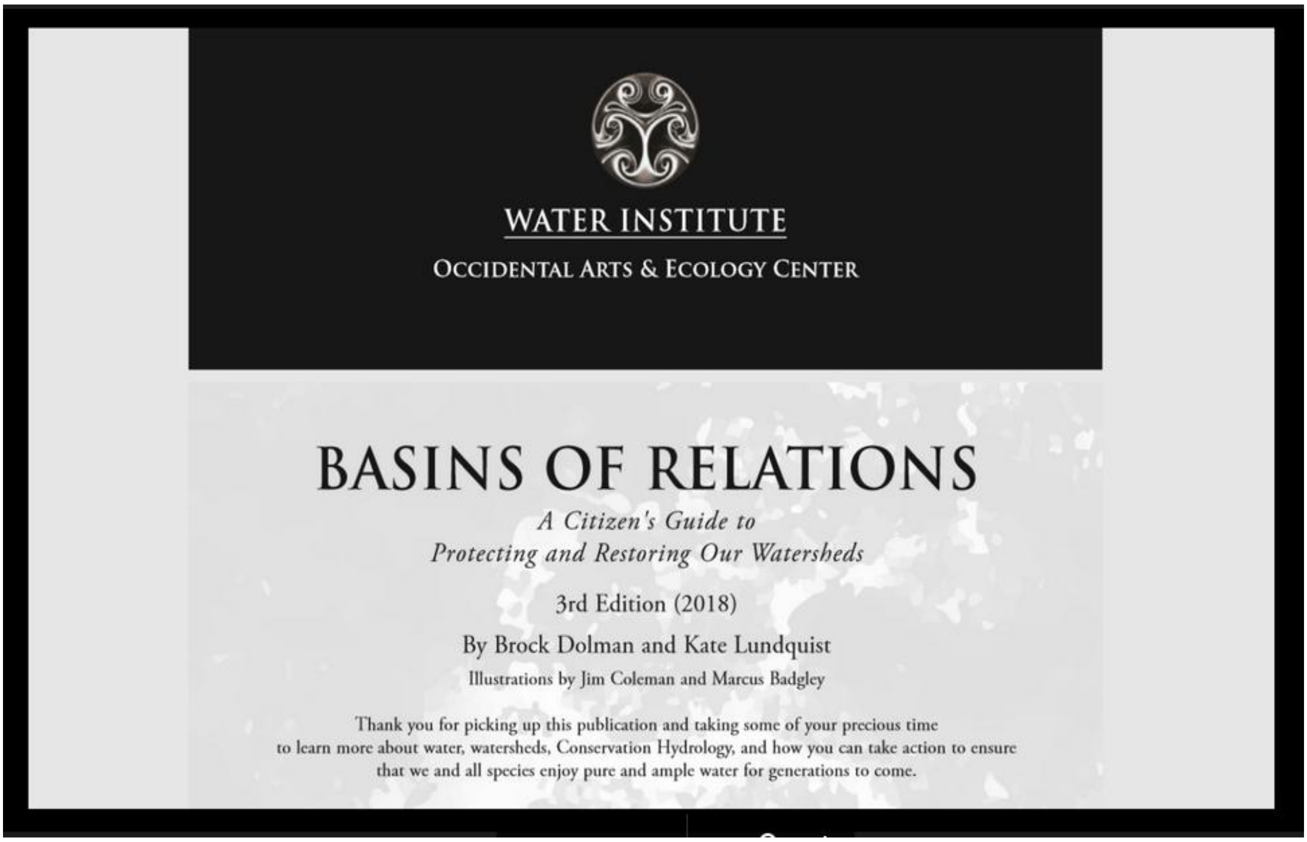


1. **Julia 'Butterfly' Hill in a Californian coastal redwood tree, her home for two years.**

experience, it is that people cherish their forests and woodlands and the benefits they bring' (17 February 2011). The emphasis is on the word 'cherish' which, far more than just the utilitarian values that forests provide, implies an affection and tenderness for forests that one might have for a friend or family member. Neither is non-violent action to protect forests confined to privileged

Soil conservation, Henry Besuden wrote nearly forty years ago, "involves the heart of the man managing the land. If he loves his soil he will save it." There are fewer hearts involved now than there were then, and more soil is being lost. Wes Jackson, writing in 1981, is forced by consideration of the increased loss to the same perception; the cause of waste is "alienation from the land": "Where there is alienation, stewardship has no chance."

Smitha Kamath – ‘Devarakaadu’ farms, Channapatna, Karnataka



WATER INSTITUTE

OCCIDENTAL ARTS & ECOLOGY CENTER

BASINS OF RELATIONS

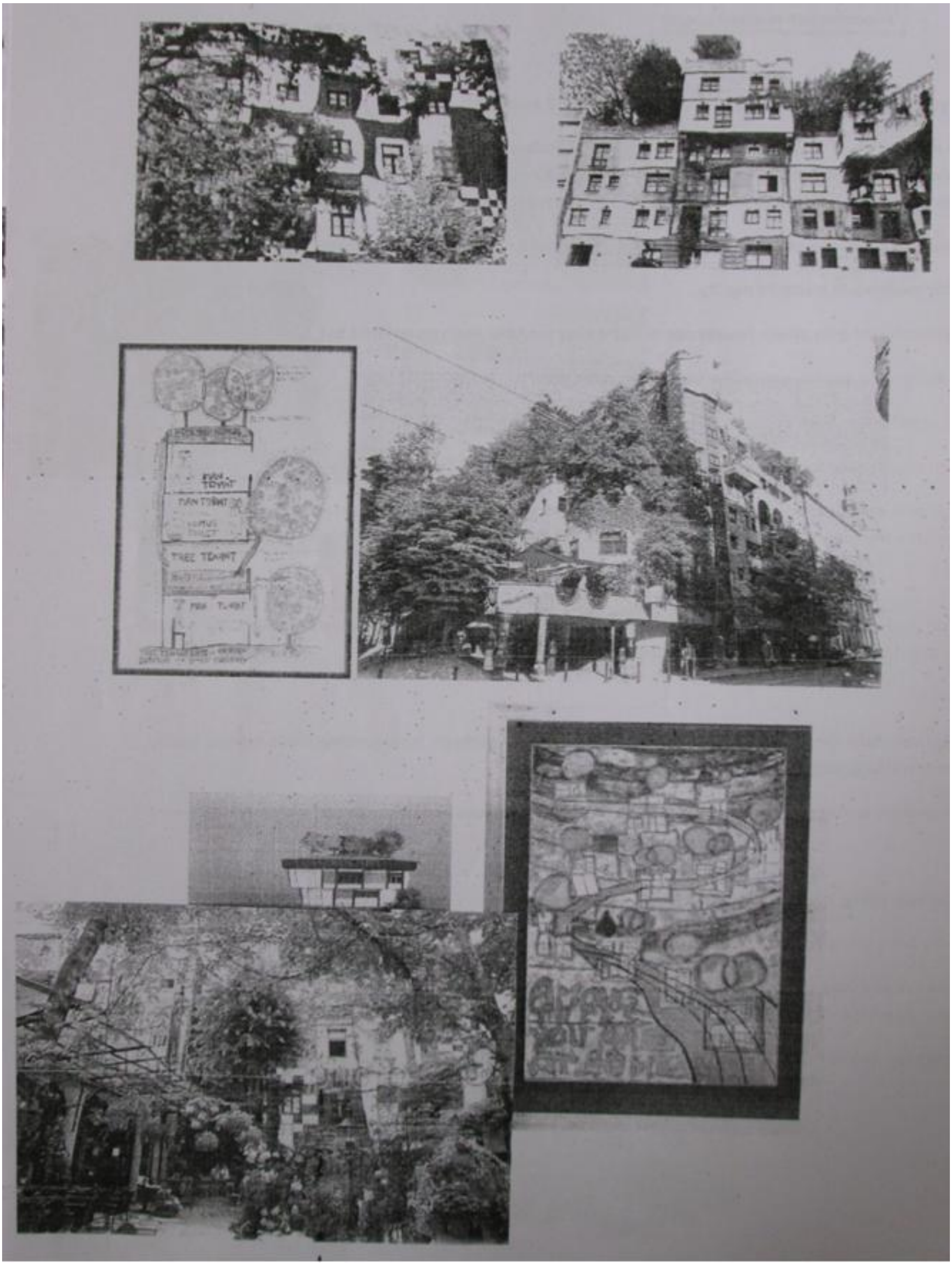
A Citizen's Guide to
Protecting and Restoring Our Watersheds

3rd Edition (2018)

By Brock Dolman and Kate Lundquist

Illustrations by Jim Coleman and Marcus Badgley

Thank you for picking up this publication and taking some of your precious time to learn more about water, watersheds, Conservation Hydrology, and how you can take action to ensure that we and all species enjoy pure and ample water for generations to come.


TREE TENANT
MAN TENANT

- **Hundertwasser** – tree planting house n city doctor, artist

How to make a mini forest with Miyawaki method

http://bengaluru.citizenmatters.in/how-to-make-mini-forest-miyawaki-method-34867
May 19, 2019 News Desk

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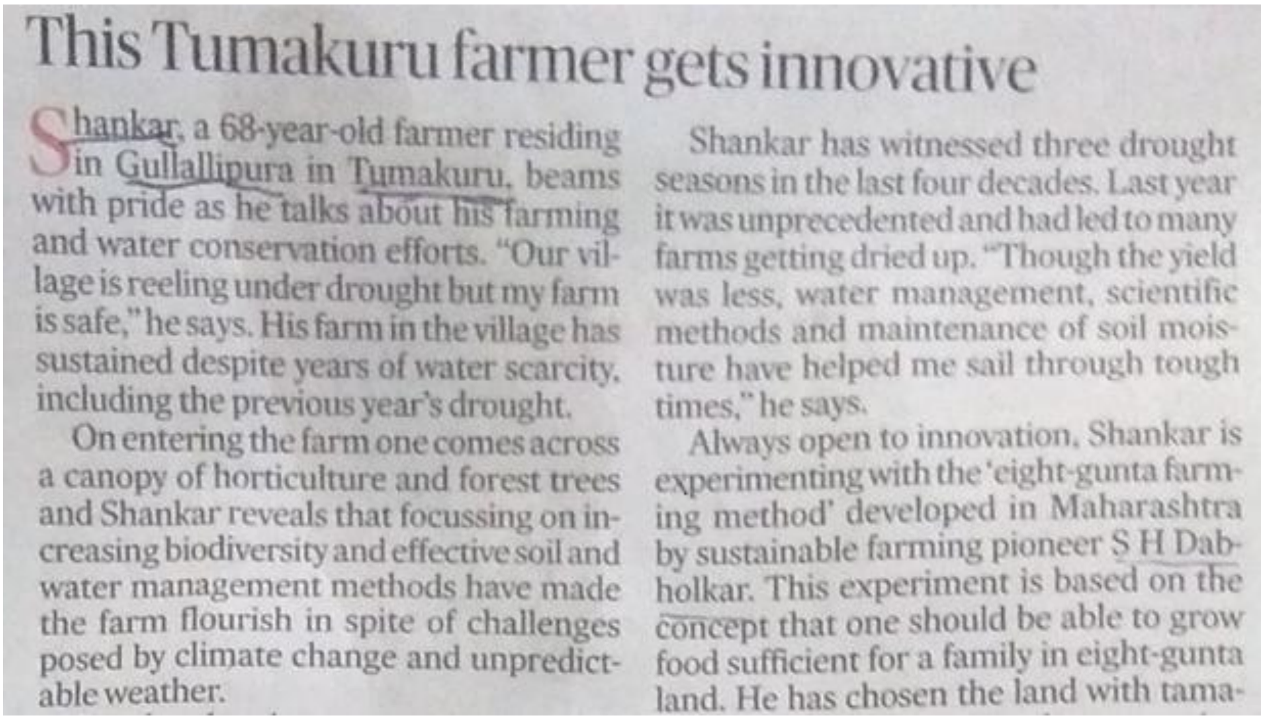
Volunteers at a Miyawaki forest plantation drive in Bengaluru last year. File Pic

Miyawaki is a technique pioneered by Japanese botanist Akira Miyawaki, that helps build dense, native forests. The approach is supposed to ensure that plant growth is 10 times faster and the resulting plantation is 30 times denser than usual. It involves planting dozens of native species in the same area, and becomes maintenance-free after the first three years.



This Tumakuru farmer gets innovative

Shankar, a 68-year-old farmer residing in Gullallipura in Tumakuru, beams with pride as he talks about his farming and water conservation efforts. "Our village is reeling under drought but my farm is safe," he says. His farm in the village has sustained despite years of water scarcity, including the previous year's drought.

On entering the farm one comes across a canopy of horticulture and forest trees and Shankar reveals that focussing on increasing biodiversity and effective soil and water management methods have made the farm flourish in spite of challenges posed by climate change and unpredictable weather.

Shankar has witnessed three drought seasons in the last four decades. Last year it was unprecedented and had led to many farms getting dried up. "Though the yield was less, water management, scientific methods and maintenance of soil moisture have helped me sail through tough times," he says.

Always open to innovation, Shankar is experimenting with the 'eight-gunta farming method' developed in Maharashtra by sustainable farming pioneer S H Dabholkar. This experiment is based on the concept that one should be able to grow food sufficient for a family in eight-gunta land. He has chosen the land with tama-

Reddy dwelt at length on the wisdom of natural farming. It was enough to stop the weeds from blocking light to the main plant. Eliminating them was a mistake as they protect the soil moisture and enhance its fertility and act "as a friend to the main plant."

And, while termites might be enemies inside the house, they were friends on the field. They eat dead leaves and dying plants and trees and convert them into manure. They never eat a living organism!

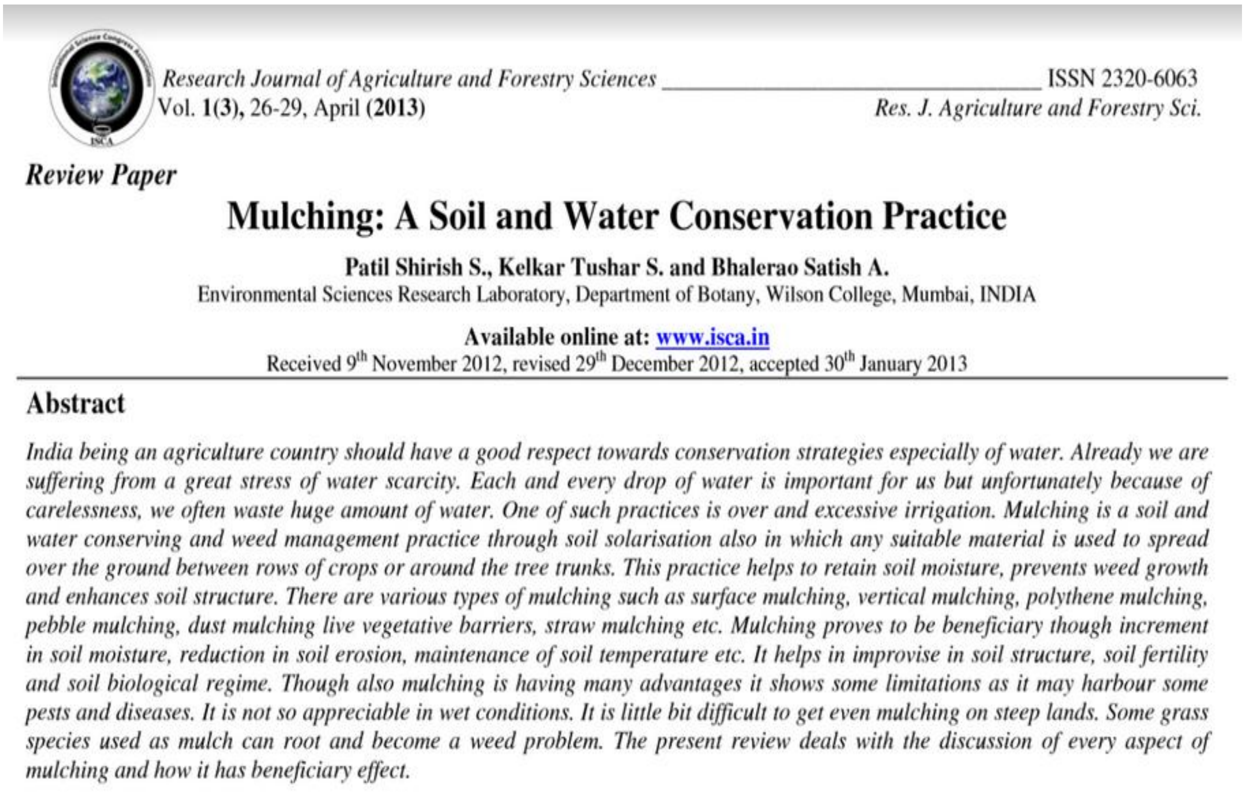
Agricultural science, Reddy argued, had spread many false ideas on farming. The research in our agricultural universities is mostly funded by multi-national companies like Monsanto and Syngenta. What else can you expect then?: he asked matter-of-factly.
He was witty. "Even Kashmir apples aren't good enough for the Bangalorean!" he remarked while deploring we got food from long distances and worsened global warming. "We get apples from Washington, New Zealand, China."

Friendly rebukes were also handed out. "Grains and fruits are seasonal. Mango is to be eaten during April, May, June, not in other months." Lots of preservatives, he added, are used in mango soft drinks. Fruits ought to be had in their season: he struck at the consumerist hubris of wanting access to everything all the time.

When Fukuoka visited Bangalore, during his visit to Santiniketan in 1988, a local NGO took him to Reddy's farm in Varthur.

"The happiest day of my life was when he came to my farm. I didn't know he was coming. My most valued teacher is Fukuoka. I got the gift of meeting him personally. You are lucky you have his book. Distribute it among your friends. His message is for humanity."

Scientific Research Studies :



Research Journal of Agriculture and Forestry Sciences ISSN 2320-6063
Vol. **1(3)**, 26-29, April **(2013)** *Res. J. Agriculture and Forestry Sci.*

Review Paper

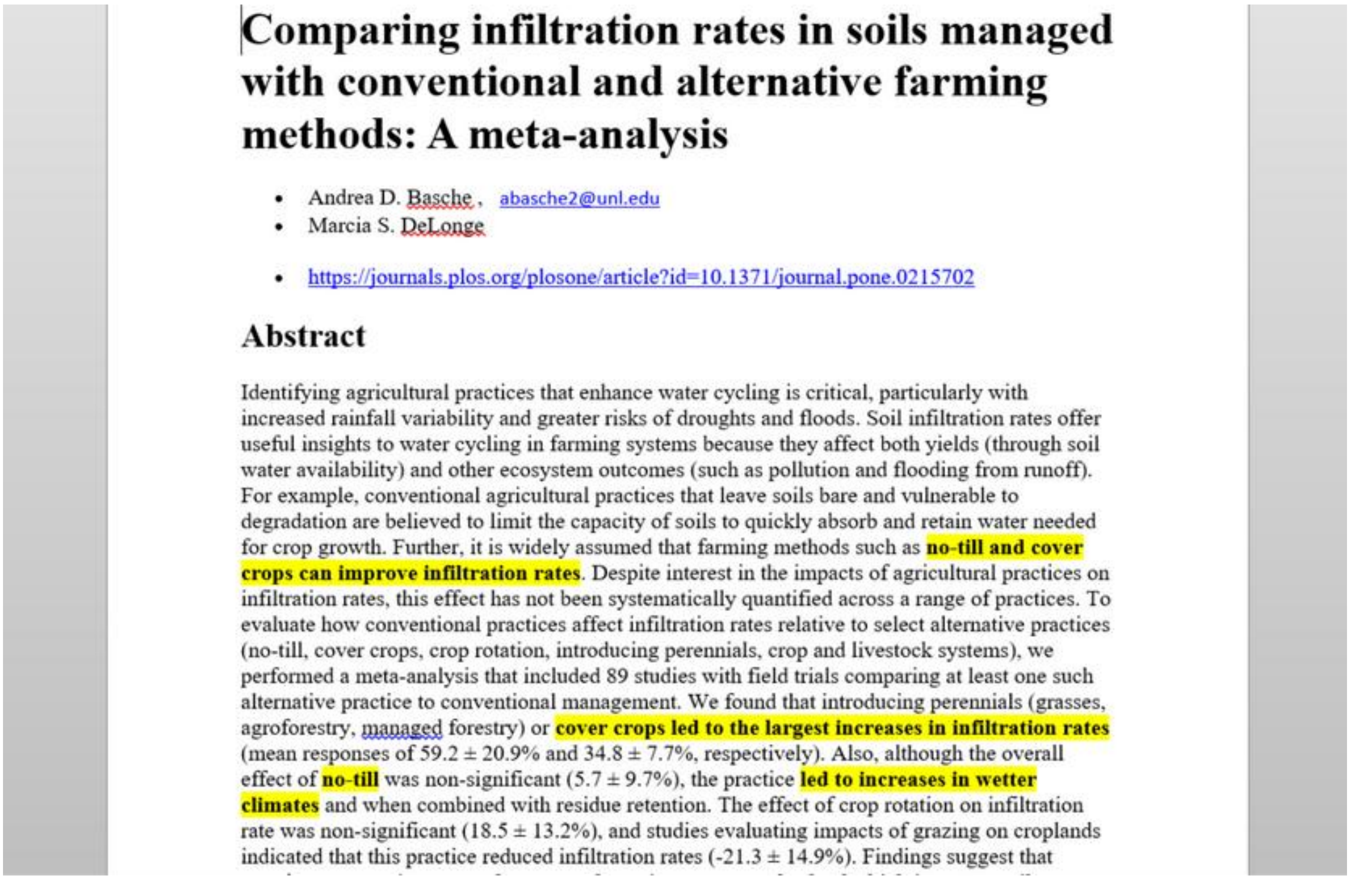
Mulching: A Soil and Water Conservation Practice

Patil Shirish S., Kelkar Tushar S. and Bhalerao Satish A.
Environmental Sciences Research Laboratory, Department of Botany, Wilson College, Mumbai, INDIA

Available online at: www.isca.in
Received 9th November 2012, revised 29th December 2012, accepted 30th January 2013

Abstract

India being an agriculture country should have a good respect towards conservation strategies especially of water. Already we are suffering from a great stress of water scarcity. Each and every drop of water is important for us but unfortunately because of carelessness, we often waste huge amount of water. One of such practices is over and excessive irrigation. Mulching is a soil and water conserving and weed management practice through soil solarisation also in which any suitable material is used to spread over the ground between rows of crops or around the tree trunks. This practice helps to retain soil moisture, prevents weed growth and enhances soil structure. There are various types of mulching such as surface mulching, vertical mulching, polythene mulching, pebble mulching, dust mulching live vegetative barriers, straw mulching etc. Mulching proves to be beneficiary though increment in soil moisture, reduction in soil erosion, maintenance of soil temperature etc. It helps in improvise in soil structure, soil fertility and soil biological regime. Though also mulching is having many advantages it shows some limitations as it may harbour some pests and diseases. It is not so appreciable in wet conditions. It is little bit difficult to get even mulching on steep lands. Some grass species used as mulch can root and become a weed problem. The present review deals with the discussion of every aspect of mulching and how it has beneficiary effect.



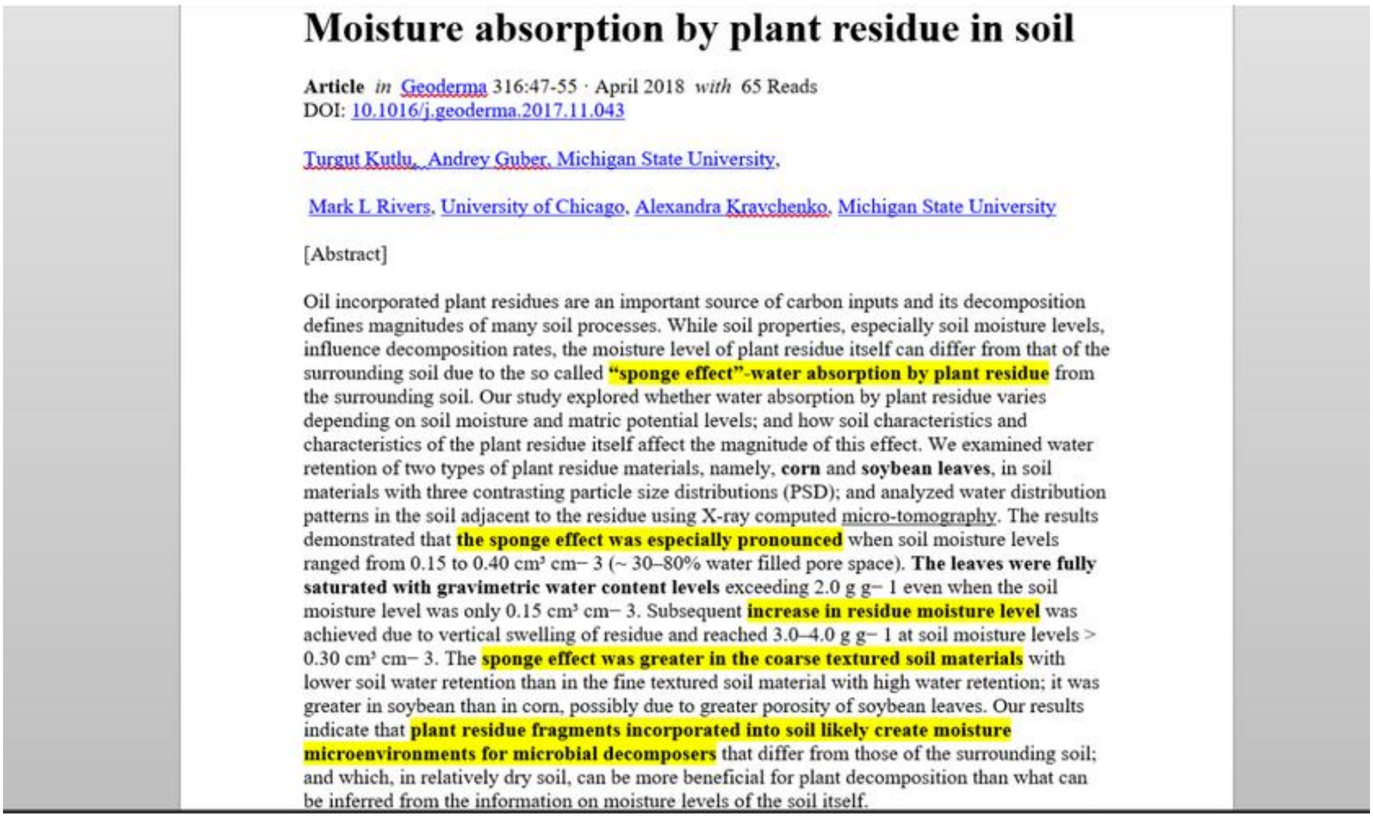
Comparing infiltration rates in soils managed with conventional and alternative farming methods: A meta-analysis

- Andrea D. Basche , abasche2@unl.edu
- Marcia S. DeLonge

- https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0215702

Abstract

Identifying agricultural practices that enhance water cycling is critical, particularly with increased rainfall variability and greater risks of droughts and floods. Soil infiltration rates offer useful insights to water cycling in farming systems because they affect both yields (through soil water availability) and other ecosystem outcomes (such as pollution and flooding from runoff). For example, conventional agricultural practices that leave soils bare and vulnerable to degradation are believed to limit the capacity of soils to quickly absorb and retain water needed for crop growth. Further, it is widely assumed that farming methods such as **no-till and cover crops can improve infiltration rates**. Despite interest in the impacts of agricultural practices on infiltration rates, this effect has not been systematically quantified across a range of practices. To evaluate how conventional practices affect infiltration rates relative to select alternative practices (no-till, cover crops, crop rotation, introducing perennials, crop and livestock systems), we performed a meta-analysis that included 89 studies with field trials comparing at least one such alternative practice to conventional management. We found that introducing perennials (grasses, agroforestry, managed forestry) or **cover crops led to the largest increases in infiltration rates** (mean responses of 59.2 ± 20.9% and 34.8 ± 7.7%, respectively). Also, although the overall effect of **no-till** was non-significant (5.7 ± 9.7%), the practice **led to increases in wetter climates** and when combined with residue retention. The effect of crop rotation on infiltration rate was non-significant (18.5 ± 13.2%), and studies evaluating impacts of grazing on croplands indicated that this practice reduced infiltration rates (-21.3 ± 14.9%). Findings suggest that



Moisture absorption by plant residue in soil

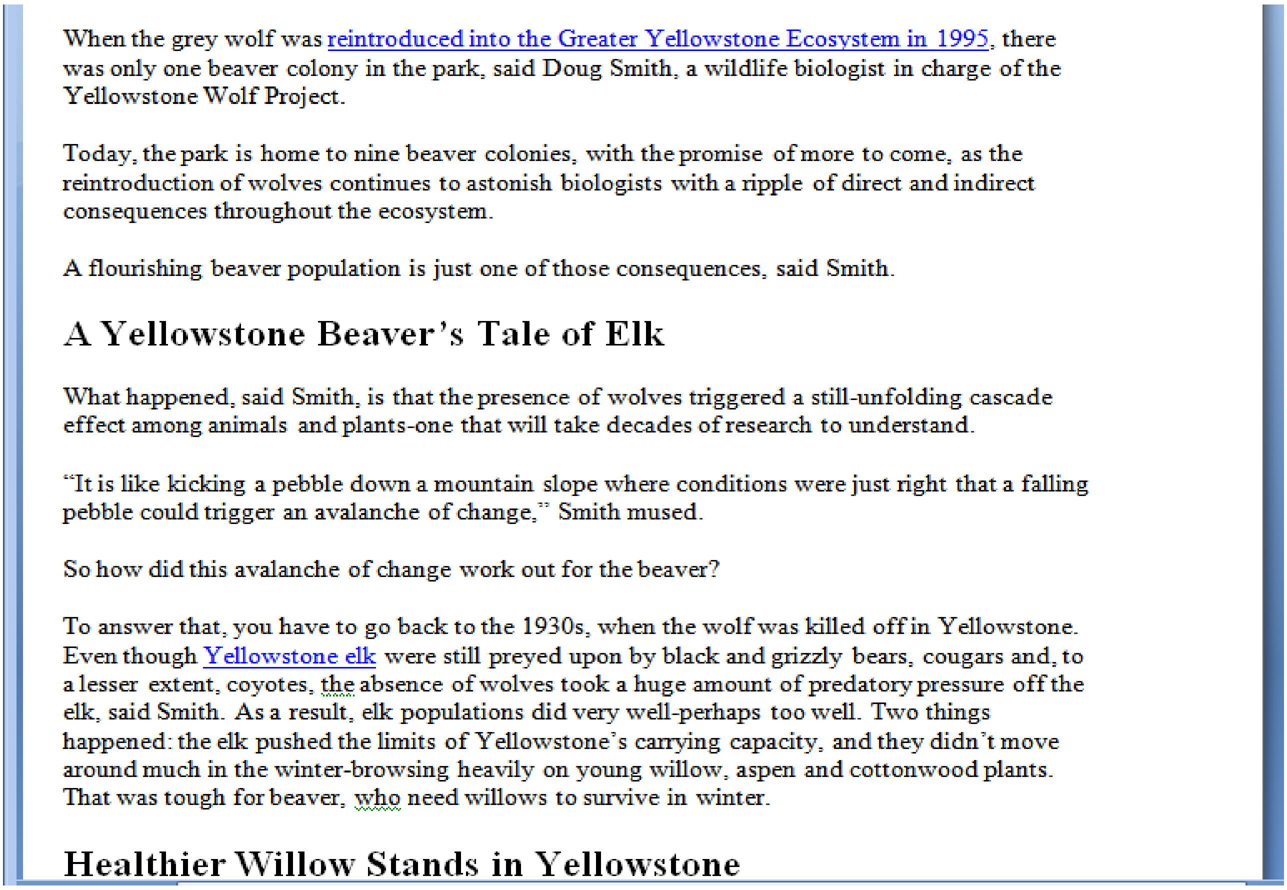
Article *in* Geoderma 316:47-55 · April 2018 *with* 65 Reads
DOI: 10.1016/j.geoderma.2017.11.043

Turgut Kutlu, Andrey Guber, Michigan State University,

Mark L Rivers, University of Chicago, Alexandra Kravchenko, Michigan State University

[Abstract]

Oil incorporated plant residues are an important source of carbon inputs and its decomposition defines magnitudes of many soil processes. While soil properties, especially soil moisture levels, influence decomposition rates, the moisture level of plant residue itself can differ from that of the surrounding soil due to the so called **"sponge effect"-water absorption by plant residue** from the surrounding soil. Our study explored whether water absorption by plant residue varies depending on soil moisture and matric potential levels; and how soil characteristics and characteristics of the plant residue itself affect the magnitude of this effect. We examined water retention of two types of plant residue materials, namely, **corn** and **soybean leaves**, in soil materials with three contrasting particle size distributions (PSD); and analyzed water distribution patterns in the soil adjacent to the residue using X-ray computed micro-tomography. The results demonstrated that **the sponge effect was especially pronounced** when soil moisture levels ranged from 0.15 to 0.40 $\mathrm{cm^3\ cm^{-3}}$ (~ 30–80% water filled pore space). **The leaves were fully saturated with gravimetric water content levels** exceeding 2.0 $\mathrm{g\ g^{-1}}$ even when the soil moisture level was only 0.15 $\mathrm{cm^3\ cm^{-3}}$. Subsequent **increase in residue moisture level** was achieved due to vertical swelling of residue and reached 3.0–4.0 $\mathrm{g\ g^{-1}}$ at soil moisture levels > 0.30 $\mathrm{cm^3\ cm^{-3}}$. The **sponge effect was greater in the coarse textured soil materials** with lower soil water retention than in the fine textured soil material with high water retention; it was greater in soybean than in corn, possibly due to greater porosity of soybean leaves. Our results indicate that **plant residue fragments incorporated into soil likely create moisture microenvironments for microbial decomposers** that differ from those of the surrounding soil; and which, in relatively dry soil, can be more beneficial for plant decomposition than what can be inferred from the information on moisture levels of the soil itself.



When the grey wolf was reintroduced into the Greater Yellowstone Ecosystem in 1995, there was only one beaver colony in the park, said Doug Smith, a wildlife biologist in charge of the Yellowstone Wolf Project.

Today, the park is home to nine beaver colonies, with the promise of more to come, as the reintroduction of wolves continues to astonish biologists with a ripple of direct and indirect consequences throughout the ecosystem.

A flourishing beaver population is just one of those consequences, said Smith.

A Yellowstone Beaver's Tale of Elk

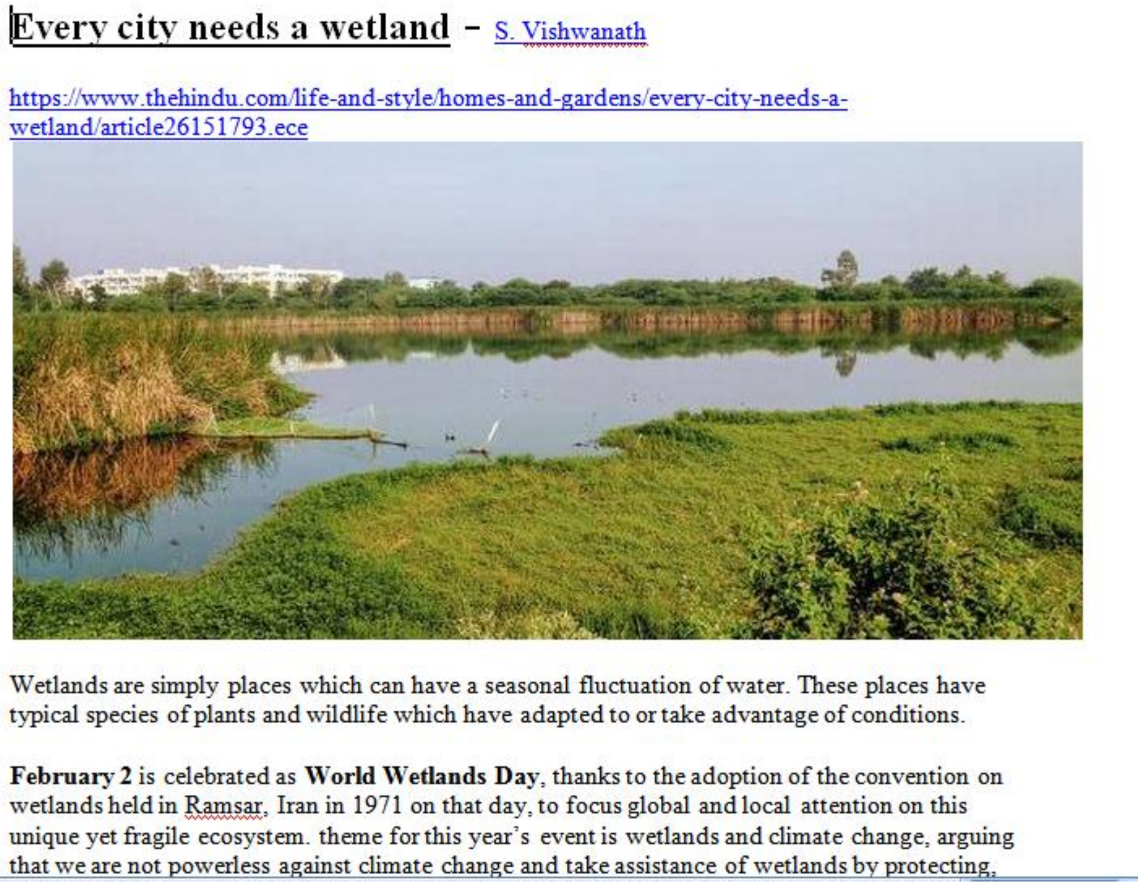
What happened, said Smith, is that the presence of wolves triggered a still-unfolding cascade effect among animals and plants-one that will take decades of research to understand.

"It is like kicking a pebble down a mountain slope where conditions were just right that a falling pebble could trigger an avalanche of change," Smith mused.

So how did this avalanche of change work out for the beaver?

To answer that, you have to go back to the 1930s, when the wolf was killed off in Yellowstone. Even though Yellowstone elk were still preyed upon by black and grizzly bears, cougars and, to a lesser extent, coyotes, the absence of wolves took a huge amount of predatory pressure off the elk, said Smith. As a result, elk populations did very well-perhaps too well. Two things happened: the elk pushed the limits of Yellowstone's carrying capacity, and they didn't move around much in the winter-browsing heavily on young willow, aspen and cottonwood plants. That was tough for beaver, who need willows to survive in winter.

Healthier Willow Stands in Yellowstone

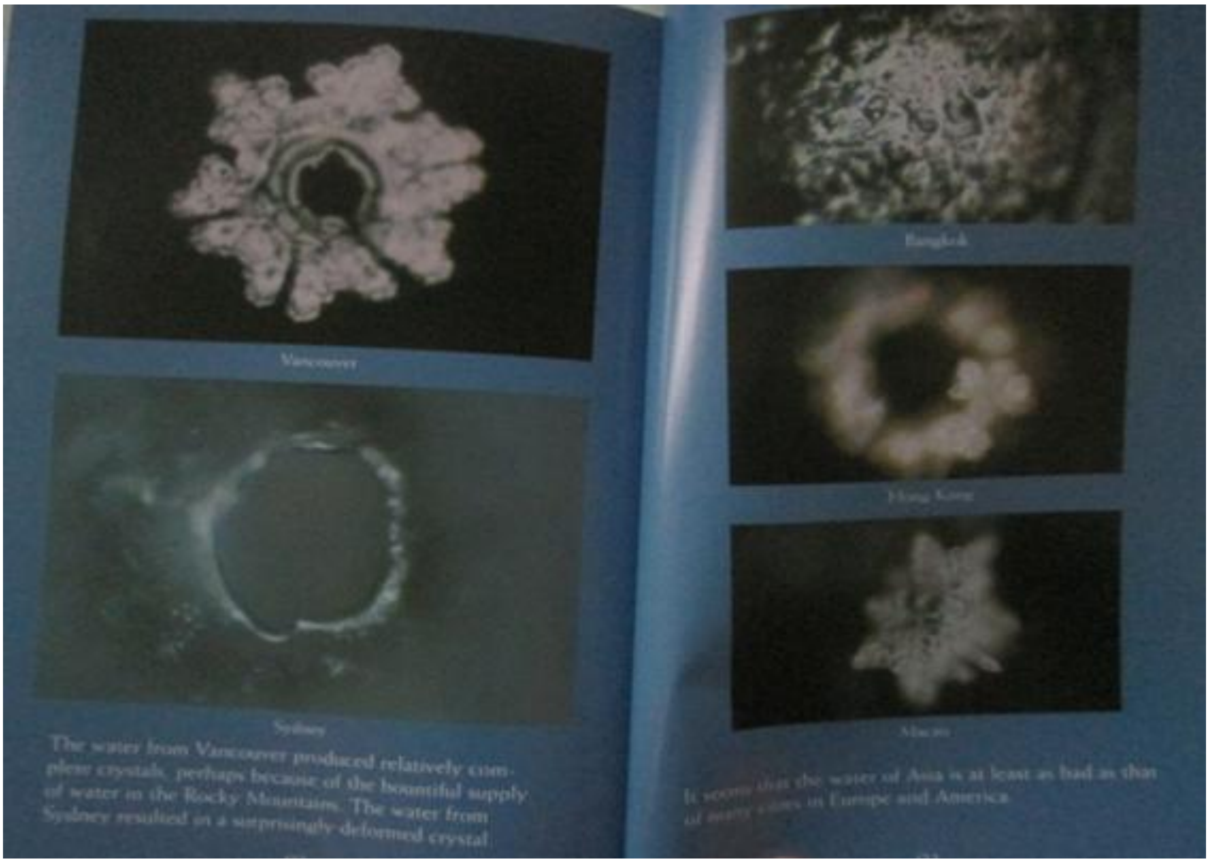


Every city needs a wetland – S. Vishwanath

https://www.thehindu.com/life-and-style/homes-and-gardens/every-city-needs-a-wetland/article26151793.ece

Wetlands are simply places which can have a seasonal fluctuation of water. These places have typical species of plants and wildlife which have adapted to or take advantage of conditions.

February 2 is celebrated as **World Wetlands Day**, thanks to the adoption of the convention on wetlands held in Ramsar, Iran in 1971 on that day, to focus global and local attention on this unique yet fragile ecosystem. theme for this year’s event is wetlands and climate change, arguing that we are not powerless against climate change and take assistance of wetlands by protecting,



Vancouver

Sydney

The water from Vancouver produced relatively complete crystals, perhaps because of the bountiful supply of water in the Rocky Mountains. The water from Sydney resulted in a surprisingly deformed crystal.

Bangkok

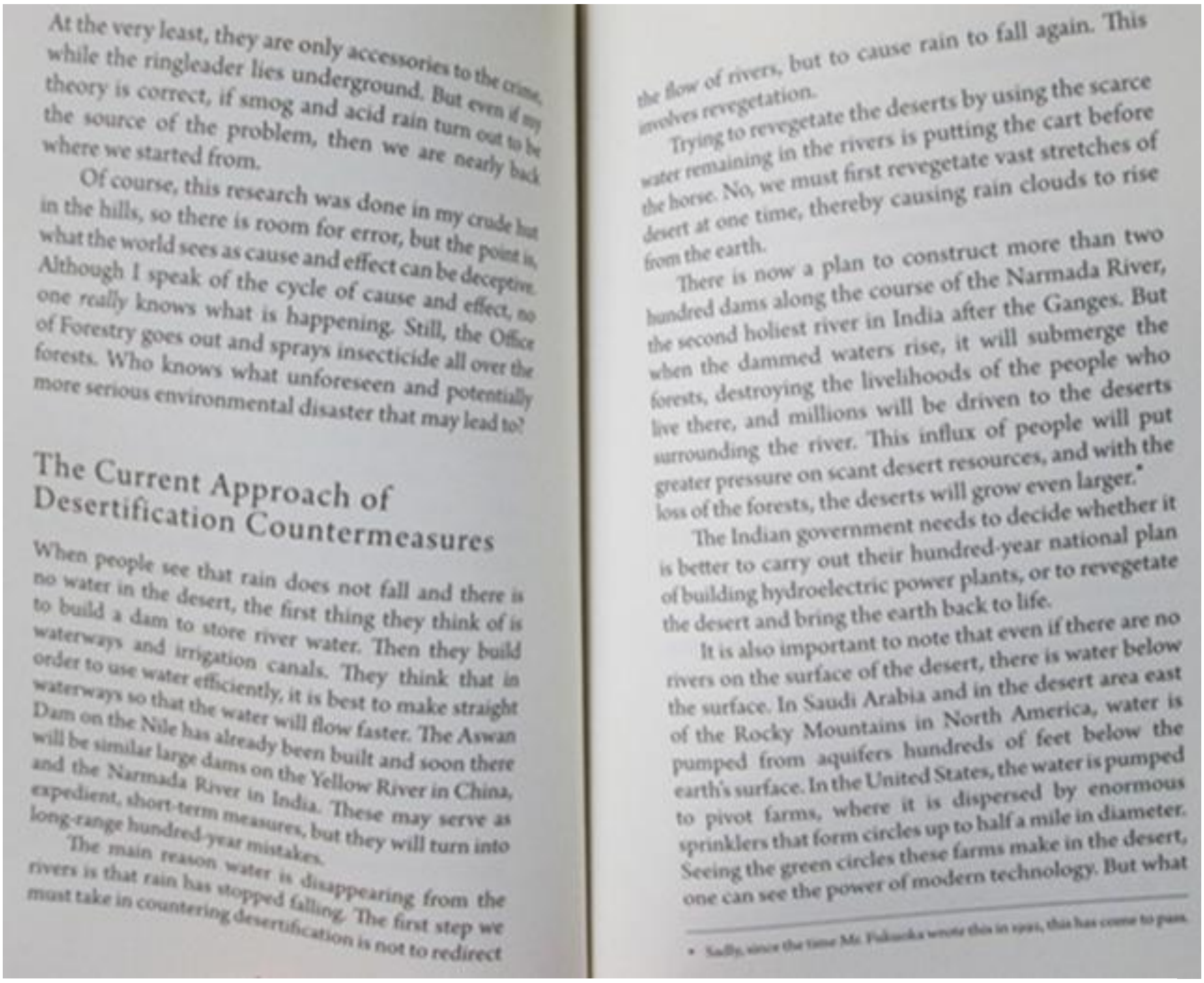
Hong Kong

Macau

It seems that the water of Asia is at least as bad as that of many cities in Europe and America.

…4 cities’ **water** **crystals** photos – by Masaru Emoto

Masanobu Fukuoka – large Dams lead to desertification :



At the very least, they are only accessories to the crime, while the ringleader lies underground. But even if my theory is correct, if smog and acid rain turn out to be the source of the problem, then we are nearly back where we started from.

Of course, this research was done in my crude hut in the hills, so there is room for error, but the point is, what the world sees as cause and effect can be deceptive. Although I speak of the cycle of cause and effect, no one *really* knows what is happening. Still, the Office of Forestry goes out and sprays insecticide all over the forests. Who knows what unforeseen and potentially more serious environmental disaster that may lead to?

The Current Approach of Desertification Countermeasures

When people see that rain does not fall and there is no water in the desert, the first thing they think of is to build a dam to store river water. Then they build waterways and irrigation canals. They think that in order to use water efficiently, it is best to make straight waterways so that the water will flow faster. The Aswan Dam on the Nile has already been built and soon there will be similar large dams on the Yellow River in China, and the Narmada River in India. These may serve as expedient, short-term measures, but they will turn into long-range hundred-year mistakes.

The main reason water is disappearing from the rivers is that rain has stopped falling. The first step we must take in countering desertification is not to redirect the flow of rivers, but to cause rain to fall again. This involves revegetation.

Trying to revegetate the deserts by using the scarce water remaining in the rivers is putting the cart before the horse. No, we must first revegetate vast stretches of desert at one time, thereby causing rain clouds to rise from the earth.

There is now a plan to construct more than two hundred dams along the course of the Narmada River, the second holiest river in India after the Ganges. But when the dammed waters rise, it will submerge the forests, destroying the livelihoods of the people who live there, and millions will be driven to the deserts surrounding the river. This influx of people will put greater pressure on scant desert resources, and with the loss of the forests, the deserts will grow even larger.*

The Indian government needs to decide whether it is better to carry out their hundred-year national plan of building hydroelectric power plants, or to revegetate the desert and bring the earth back to life.

It is also important to note that even if there are no rivers on the surface of the desert, there is water below the surface. In Saudi Arabia and in the desert area east of the Rocky Mountains in North America, water is pumped from aquifers hundreds of feet below the earth's surface. In the United States, the water is pumped to pivot farms, where it is dispersed by enormous sprinklers that form circles up to half a mile in diameter. Seeing the green circles these farms make in the desert, one can see the power of modern technology. But what

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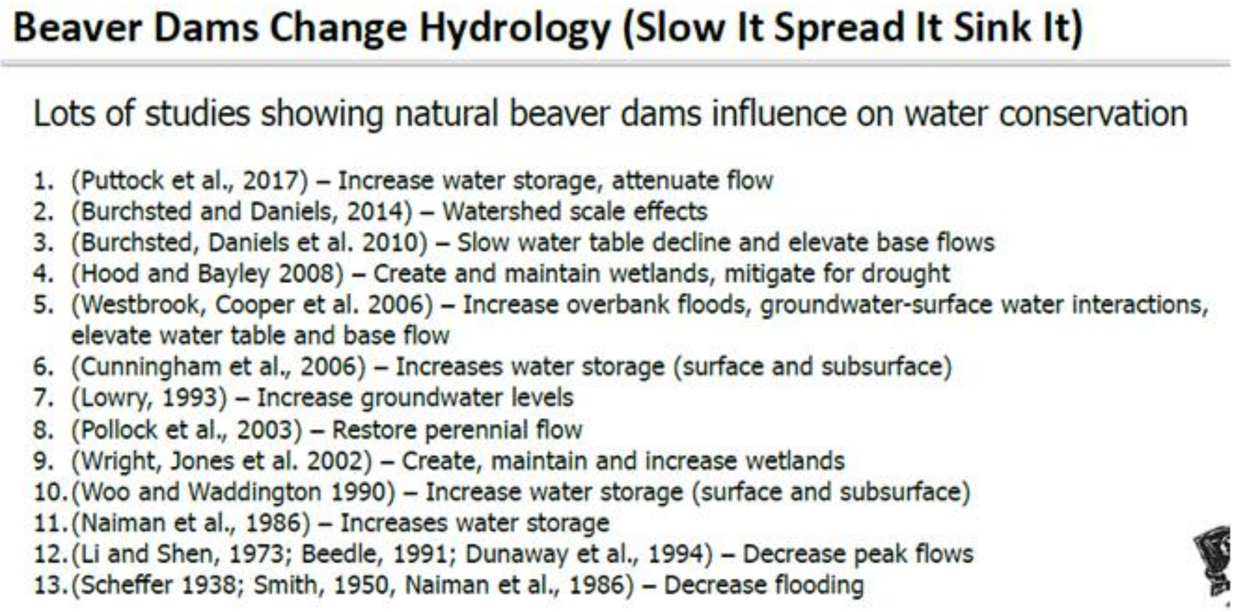
* Sadly, since the time Mr. Fukuoka wrote this in [illegible], this has come to pass.



Beaver Dams Change Hydrology (Slow It Spread It Sink It)

Lots of studies showing natural beaver dams influence on water conservation

1. (Puttock et al., 2017) – Increase water storage, attenuate flow
2. (Burchsted and Daniels, 2014) – Watershed scale effects
3. (Burchsted, Daniels et al. 2010) – Slow water table decline and elevate base flows
4. (Hood and Bayley 2008) – Create and maintain wetlands, mitigate for drought
5. (Westbrook, Cooper et al. 2006) – Increase overbank floods, groundwater-surface water interactions, elevate water table and base flow
6. (Cunningham et al., 2006) – Increases water storage (surface and subsurface)
7. (Lowry, 1993) – Increase groundwater levels
8. (Pollock et al., 2003) – Restore perennial flow
9. (Wright, Jones et al. 2002) – Create, maintain and increase wetlands
10. (Woo and Waddington 1990) – Increase water storage (surface and subsurface)
11. (Naiman et al., 1986) – Increases water storage
12. (Li and Shen, 1973; Beedle, 1991; Dunaway et al., 1994) – Decrease peak flows
13. (Scheffer 1938; Smith, 1950, Naiman et al., 1986) – Decrease flooding

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FHC THE FLUVIAL HABITATS CENTER

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Nick Bouwes

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Scott Shahverdian

Wally Macfarlane

- Sara Bangen (USU)
- Reid Camp (ELR/ Anabranch)
- Philip Bailey (NAR)
- Dennis Duehren (USFS) Jordan Gilbert (USU)
- Jordan Gilbert (USU)
- Konrad Hafen (USU)
- Chalese Hafen (USU)
- Brad Higginson (USFS)
- Thad Heater (SGI)
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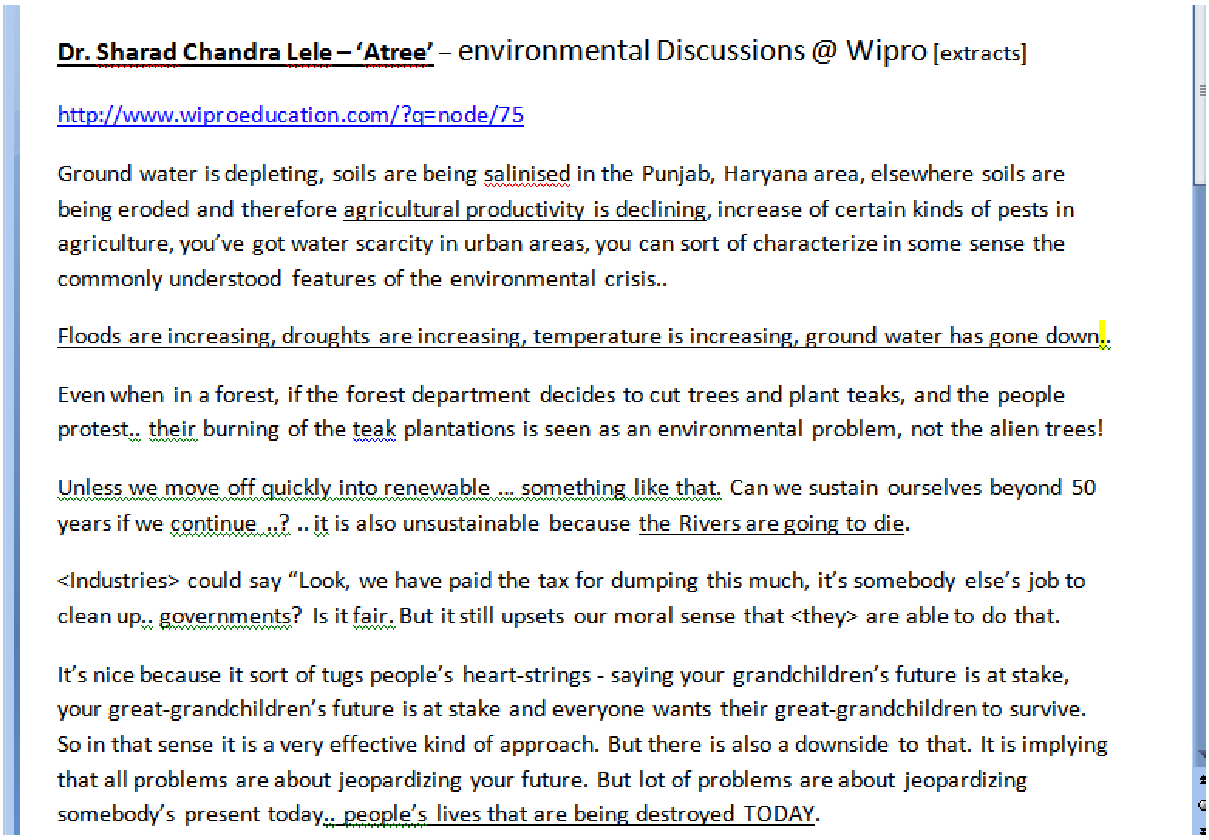
- Justin Jimenz (BLM)
- Martha Jensen (USU)
- Timmie Mandish (NRCS)
- Marcus Miller (NRCS)
- Elijah Portugal (USU)
- Michael Pollock (NOAA)
- Brett Roper (USFS)
- Kent Sorenson (UDWR)
- Jay & Diane Tanner
- Carol Volk (SFR)
- Nick Weber (ELR/ Anabranch)
- Jay Wilde
- And many others… I'm neglecting



Dr. Sharad Chandra Lele – 'Atree' – environmental Discussions @ Wipro [extracts]

http://www.wiproeducation.com/?q=node/75

Ground water is depleting, soils are being salinised in the Punjab, Haryana area, elsewhere soils are being eroded and therefore agricultural productivity is declining, increase of certain kinds of pests in agriculture, you've got water scarcity in urban areas, you can sort of characterize in some sense the commonly understood features of the environmental crisis..

Floods are increasing, droughts are increasing, temperature is increasing, ground water has gone down..

Even when in a forest, if the forest department decides to cut trees and plant teaks, and the people protest.. their burning of the teak plantations is seen as an environmental problem, not the alien trees!

Unless we move off quickly into renewable … something like that. Can we sustain ourselves beyond 50 years if we continue ..? .. it is also unsustainable because the Rivers are going to die.

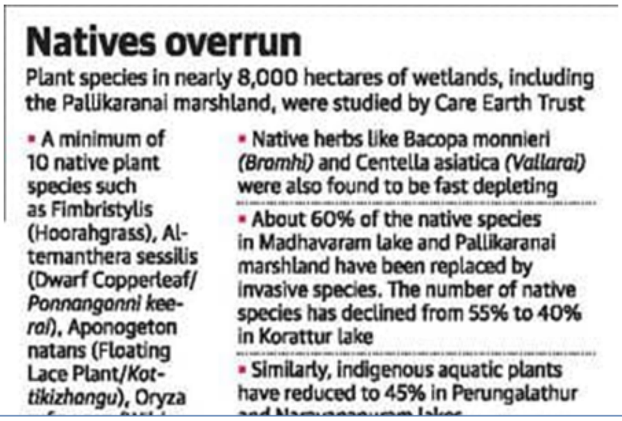
<Industries> could say "Look, we have paid the tax for dumping this much, it's somebody else's job to clean up.. governments? Is it fair. But it still upsets our moral sense that <they> are able to do that.

It's nice because it sort of tugs people's heart-strings - saying your grandchildren's future is at stake, your great-grandchildren's future is at stake and everyone wants their great-grandchildren to survive. So in that sense it is a very effective kind of approach. But there is also a downside to that. It is implying that all problems are about jeopardizing your future. But lot of problems are about jeopardizing somebody's present today.. people's lives that are being destroyed TODAY.

https://www.thehindu.com/news/cities/chennai/indigenous-flora-in-city-wetlands-under-threat/article26039519.ece?utm_source=IndiaWaterPortal+List&utm_campaign=33927b7157-EMAIL_CAMPAIGN_2017_12_28_COPY_01&utm_medium=email&utm_term=0_5c11b2aed0-33927b7157-231891809

Retteri or Madhavaram lake and Pallikaranai marshland are among the worst affected wetlands in the city. About 60% of the plant species have been overrun by invasive species in the past two years.

The study observed the native plant species found in the wetlands of Sembakkam, Ambattur, Perumbakkam, Narayanapuram, Thalambur, Korattur, Madhavaram and Pallikaranai marshland for two years.



Natives overrun

Plant species in nearly 8,000 hectares of wetlands, including the Pallikaranai marshland, were studied by Care Earth Trust

- A minimum of 10 native plant species such as Fimbristylis (Hoorahgrass), Alternanthera sessilis (Dwarf Copperleaf/*Ponnangonni keerai*), Aponogeton natans (Floating Lace Plant/*Kottikizhangu*), Oryza
- Native herbs like Bacopa monnieri *(Bromhi)* and Centella asiatica *(Vallarai)* were also found to be fast depleting
- About 60% of the native species in Madhavaram lake and Pallikaranai marshland have been replaced by invasive species. The number of native species has declined from 55% to 40% in Korattur lake
- Similarly, indigenous aquatic plants have reduced to 45% in Perungalathur

Eco-Friendly.. Water Draining Simple Ideal Culverts at Indian Institute of Science

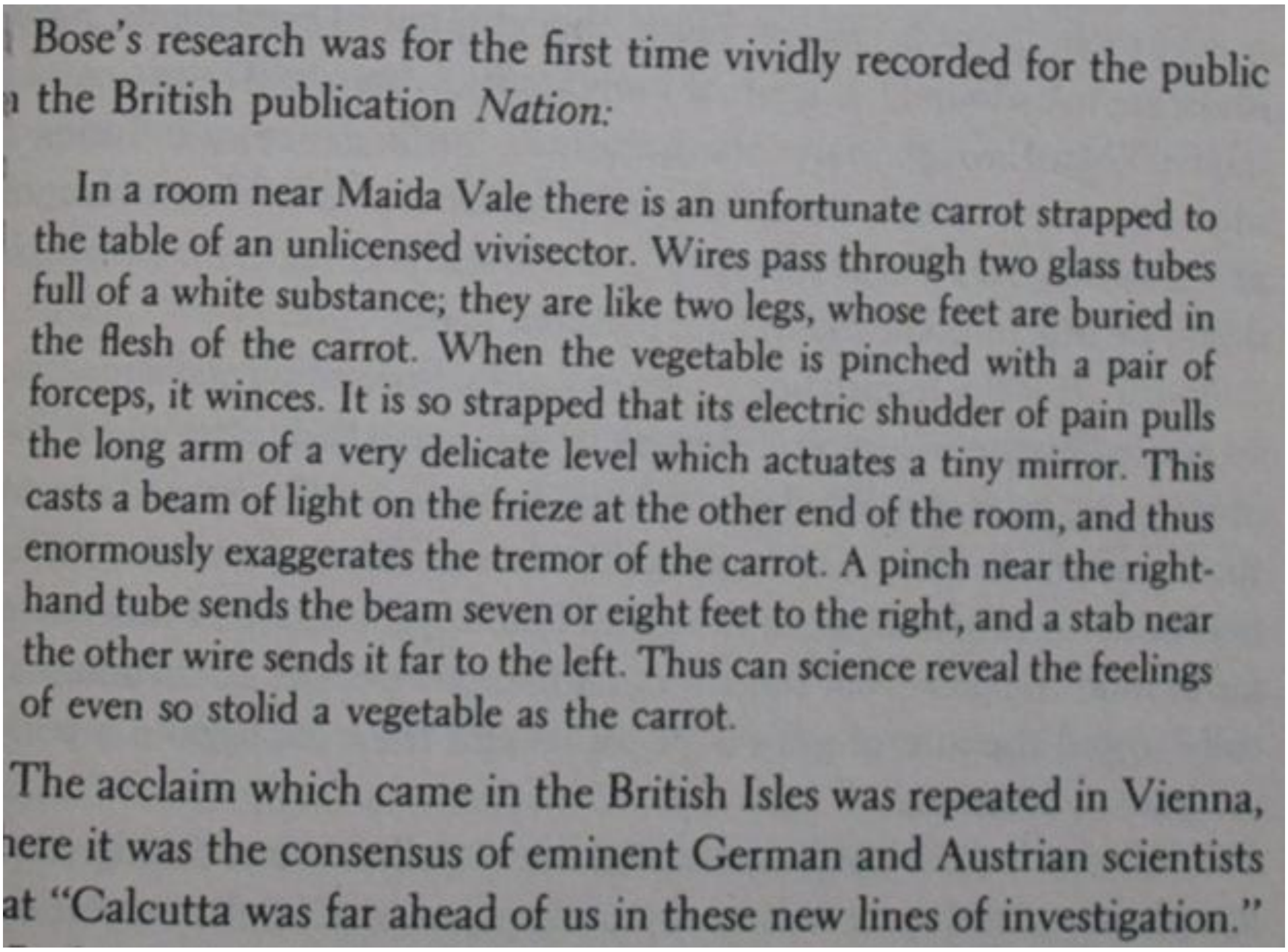
Indira Gandhi Rashtriya Manav Sangralaya, Bhopal, and Aryan Books International, 2007.

1.10e "**The Gaia Theory**" – developed by James Lovelock (1979)

takes the idea of Systems Theory and applies it to the whole planet. All life on earth can be seen as a whole, like a Super Form (Gaia after the Greek Earth Goddess). All living systems have a tendency to keep themselves in balance and evolve over time.

It is interesting to look at the details of the Gaia Theory as advocated by Lovelock. His question is, "How did Gaia adapt to the conditions of atmosphere so that life could begin here?"
The Earth came into exist ence as a separate body about 4,500 million years ago or (4 ½ aeons ago). Earliest traces have been found in sedimentary rocks about 3 aeons ago. But this is not a complete record. Thus, not much is known about the origin of life on earth or about its early evolution. The question that Lovelock puts across is – "What was the state of the earth 3 ½ aeons ago? Why was our planet able to bear and sustain life when it"s nearest siblings, Mars and Venus, apparently failed?
Lovelock"s answer is that Gaia is a complex entity involving the earth"s biosphere, atmosphere, oceans and soil. This totality, according to him, comprises of a feedback system seeking an optimal physical and chemical environment for life on this planet. It is by active control that relatively constant conditions are maintained on planet earth.
This, he calls „homeostatis".

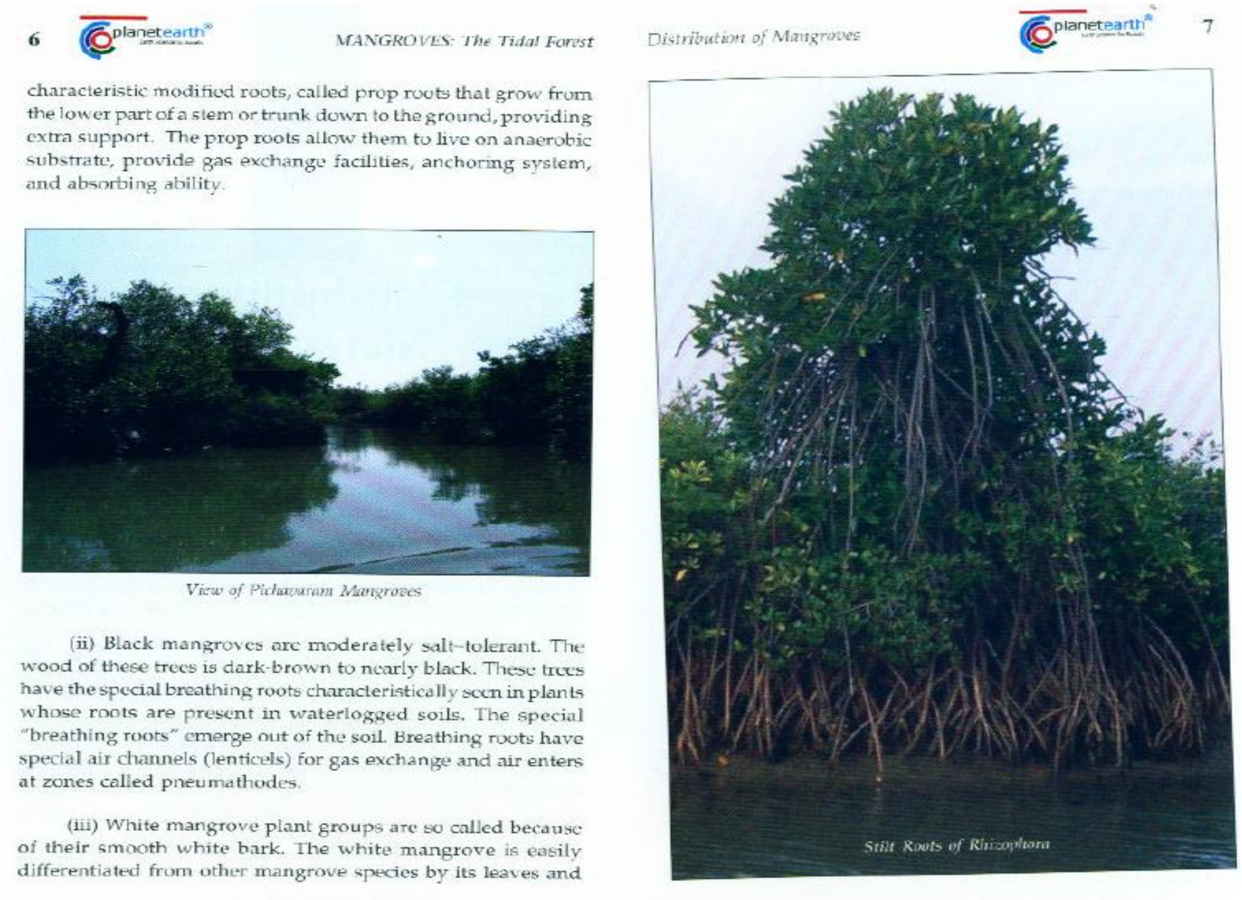
The Gaia Hypothesis states that the **Earth is alive and we are a part of it.**



Bose's research was for the first time vividly recorded for the public the British publication *Nation:*

> In a room near Maida Vale there is an unfortunate carrot strapped to the table of an unlicensed vivisector. Wires pass through two glass tubes full of a white substance; they are like two legs, whose feet are buried in the flesh of the carrot. When the vegetable is pinched with a pair of forceps, it winces. It is so strapped that its electric shudder of pain pulls the long arm of a very delicate level which actuates a tiny mirror. This casts a beam of light on the frieze at the other end of the room, and thus enormously exaggerates the tremor of the carrot. A pinch near the right-hand tube sends the beam seven or eight feet to the right, and a stab near the other wire sends it far to the left. Thus can science reveal the feelings of even so stolid a vegetable as the carrot.

The acclaim which came in the British Isles was repeated in Vienna, ere it was the consensus of eminent German and Austrian scientists at "Calcutta was far ahead of us in these new lines of investigation."



6 planetearth MANGROVES: The Tidal Forest

characteristic modified roots, called prop roots that grow from the lower part of a stem or trunk down to the ground, providing extra support. The prop roots allow them to live on anaerobic substrate, provide gas exchange facilities, anchoring system, and absorbing ability.

View of Pichavaram Mangroves

(ii) Black mangroves are moderately salt-tolerant. The wood of these trees is dark-brown to nearly black. These trees have the special breathing roots characteristically seen in plants whose roots are present in waterlogged soils. The special "breathing roots" emerge out of the soil. Breathing roots have special air channels (lenticels) for gas exchange and air enters at zones called pneumathodes.

(iii) White mangrove plant groups are so called because of their smooth white bark. The white mangrove is easily differentiated from other mangrove species by its leaves and

Distribution of Mangroves planetearth 7

Stilt Roots of Rhizophora

An uneasy alliance: Indigenous Traditional Knowledge enriches science

February 18, 2019 10.58am EST Updated February 27, 2019 9.03pm EST

The study of caribou ecology in the Sahtú region of Canada's Northwest Territories shows how western science and Indigenous

Describing the bund proposal as “hydrologically destructive” for Gurugram, Manu Bhatnagar of INTACH (Indian National Trust for Art and Cultural Heritage) said, “The Najafgarh drain and bund will destroy the lake without even solving the problem of waterlogging. We don’t need to save land, we need to some more land under water.
We’re absolutely against the bund. These are only money-making projects for engineers, contractors and politicians. It’s hydrologically destructive for a city like Gurgaon, which will soon run out of groundwater.” INTACH, a non-profit organisation, filed a petition in NGT four years ago, demanding wetland status for Najafgarh lake.

Bhatnagar’s proposed solution is, “Najafgarh lake can become a Ramsar site. By declaring it a wetland, authorities can generate various revenue streams from tourism, which can bring in money. Right now, authorities are looking at it solely through the lens of real estate. They’re not thinking of what will sustain that real estate project.” A Ramsar site is a designated wetland of international importance under the Ramsar Convention.

I

Current World Environment Vol. **10**(3), 848-867 (2015)

Environmental Perspectives of Pond Ecosystems: Global Issues, Services and Indian Scenarios

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http://dx.doi.org/10.12944/CWE.10.3.16
(Received: October 03, 2015; Accepted: October 29, 2015)

Ponds are an integral component of the hydrological system; and perform diverse roles in the biosphere. Studies on pond ecosystems are, however, often neglected, probably, due to their little size. There is no doubt that little things perform many important activities in our lives.

In Europe, pond conservation initiative has, however, resulted in many studies on the subject.

Biggs *et al.* describe ponds as water bodies with an area between 1 square metre and 2 hectares (20,000 square metres), which may be seasonal or permanent, including both natural & man-made water bodies.

Downing *et al.* — the number of ponds with size less than 1 hectare is around 277,400,000; and the number of water bodies in the range of 1 to 10 hectares is around 24,120,000. The estimate suggests that these water bodies represent over 90% of the planet’s 304 million standing water bodies, which accounts for roughly 30% of the earth’s standing water by surface area.

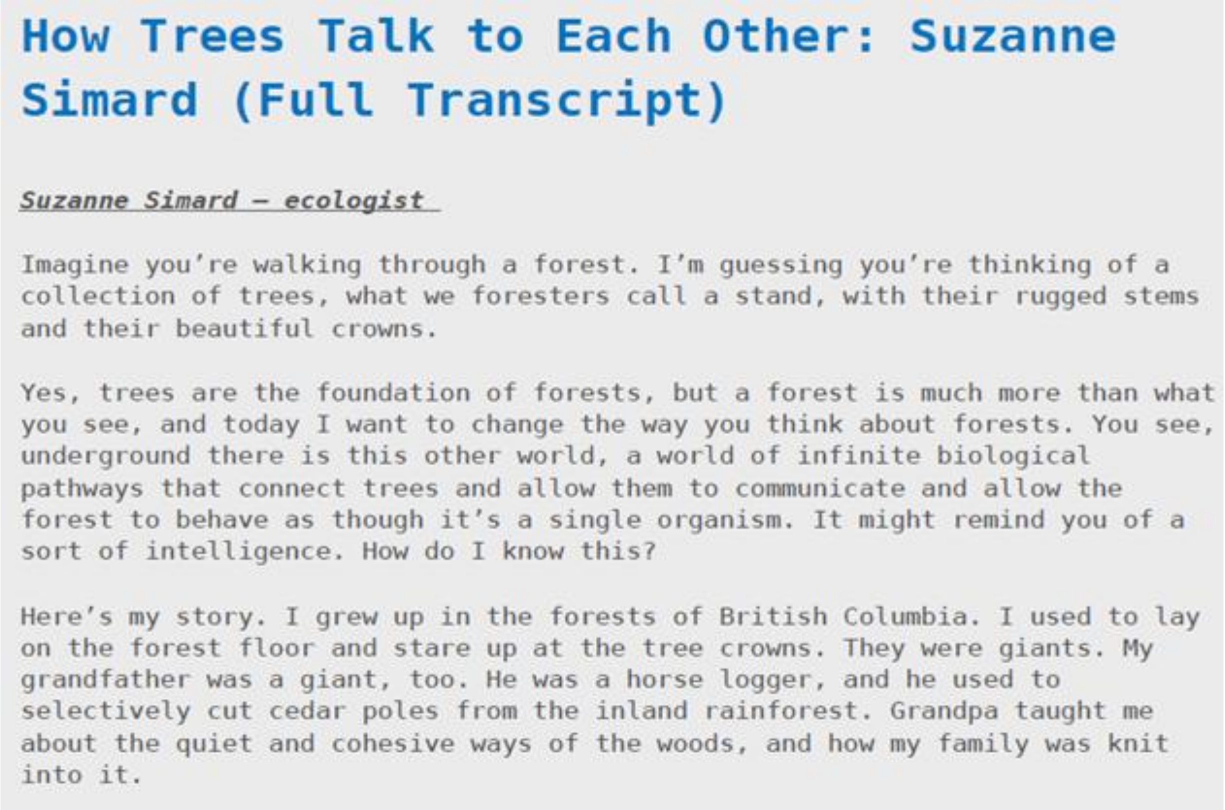
Although ponds are small wetland features their ecological roles and landscape values are substantial. Ponds are an important freshwater habitat which, at landscape level, play critical role in maintaining biodiversity. However, they are also vulnerable to degradation. With proper planning ponds can bring major benefits in terms of biodiversity, pollution alleviation, flood relief and climate change. At micro level they are remarkably cheap, and easy to make, manage and protect.

A study from finds that water from sacred groves conforms to all WHO standards of **potability** and is **of better quality** than water from surrounding areas.

Uttarakhand
Auli Bugyal, a meadow in Uttarakhand. Auli Bugyal, (Photo courtesy: Sandeep Brar Jat)

Sacred groves are undisturbed or preserved patches of vegetation or forested areas located on the outskirts of villages, towns or plains that are conserved by communities by dedicating them to local folk deities or ancestral spirits. Locals believe that these forests belong to deities and their destruction could anger them, a belief that has functioned well as a means to protect these small patches of forests. **Valuable sources of water**

Sacred groves play an important role in preserving biodiversity by supporting and protecting a range of birds and animals. They also help in soil and water conservation. The forests of sacred groves are found to have a greater watershed value in terms of water yield and quality than other types of landscapes. Ponds, streams or springs found in the sacred groves serve as water sources for the area around the year even when other water sources go dry. The vegetative cover, on the other hand, helps in recharging aquifers, improving soil stability and in preventing soil erosion.



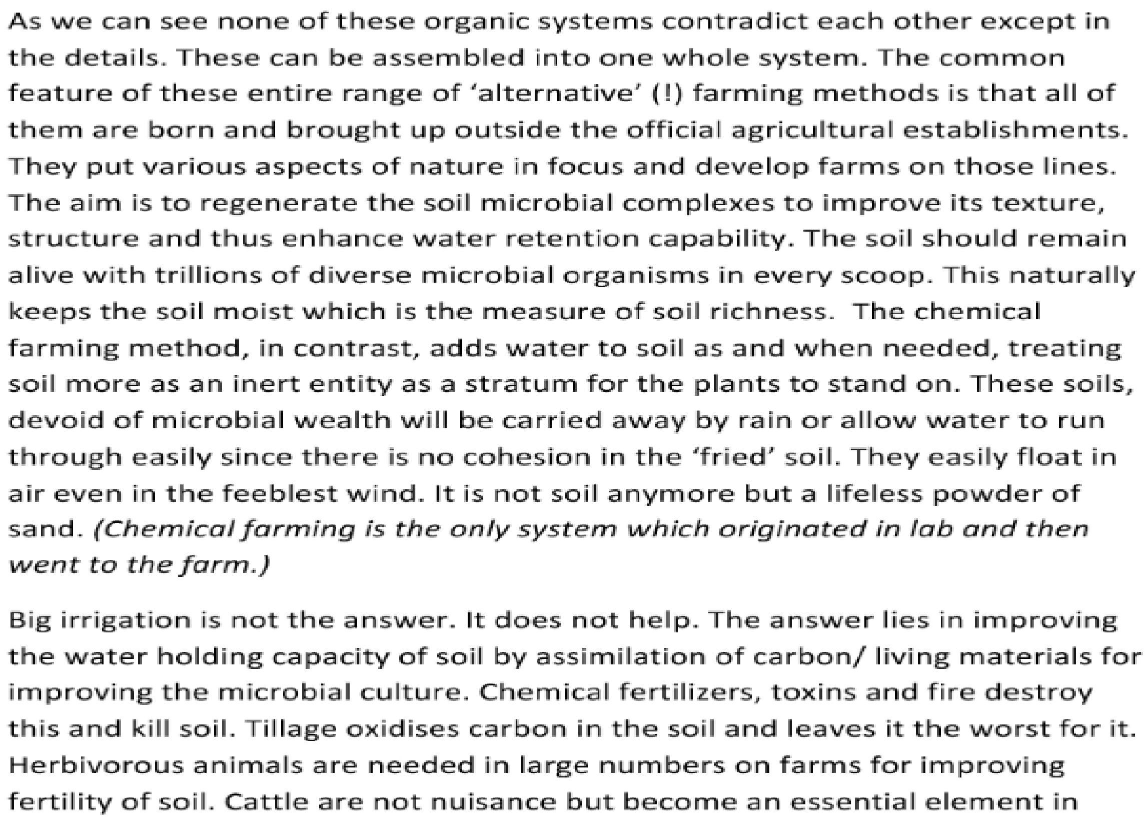
How Trees Talk to Each Other: Suzanne Simard (Full Transcript)

Suzanne Simard – ecologist

Imagine you're walking through a forest. I'm guessing you're thinking of a collection of trees, what we foresters call a stand, with their rugged stems and their beautiful crowns.

Yes, trees are the foundation of forests, but a forest is much more than what you see, and today I want to change the way you think about forests. You see, underground there is this other world, a world of infinite biological pathways that connect trees and allow them to communicate and allow the forest to behave as though it's a single organism. It might remind you of a sort of intelligence. How do I know this?

Here's my story. I grew up in the forests of British Columbia. I used to lay on the forest floor and stare up at the tree crowns. They were giants. My grandfather was a giant, too. He was a horse logger, and he used to selectively cut cedar poles from the inland rainforest. Grandpa taught me about the quiet and cohesive ways of the woods, and how my family was knit into it.



As we can see none of these organic systems contradict each other except in the details. These can be assembled into one whole system. The common feature of these entire range of 'alternative' (!) farming methods is that all of them are born and brought up outside the official agricultural establishments. They put various aspects of nature in focus and develop farms on those lines. The aim is to regenerate the soil microbial complexes to improve its texture, structure and thus enhance water retention capability. The soil should remain alive with trillions of diverse microbial organisms in every scoop. This naturally keeps the soil moist which is the measure of soil richness. The chemical farming method, in contrast, adds water to soil as and when needed, treating soil more as an inert entity as a stratum for the plants to stand on. These soils, devoid of microbial wealth will be carried away by rain or allow water to run through easily since there is no cohesion in the 'fried' soil. They easily float in air even in the feeblest wind. It is not soil anymore but a lifeless powder of sand. *(Chemical farming is the only system which originated in lab and then went to the farm.)*

Big irrigation is not the answer. It does not help. The answer lies in improving the water holding capacity of soil by assimilation of carbon/ living materials for improving the microbial culture. Chemical fertilizers, toxins and fire destroy this and kill soil. Tillage oxidises carbon in the soil and leaves it the worst for it. Herbivorous animals are needed in large numbers on farms for improving fertility of soil. Cattle are not nuisance but become an essential element in

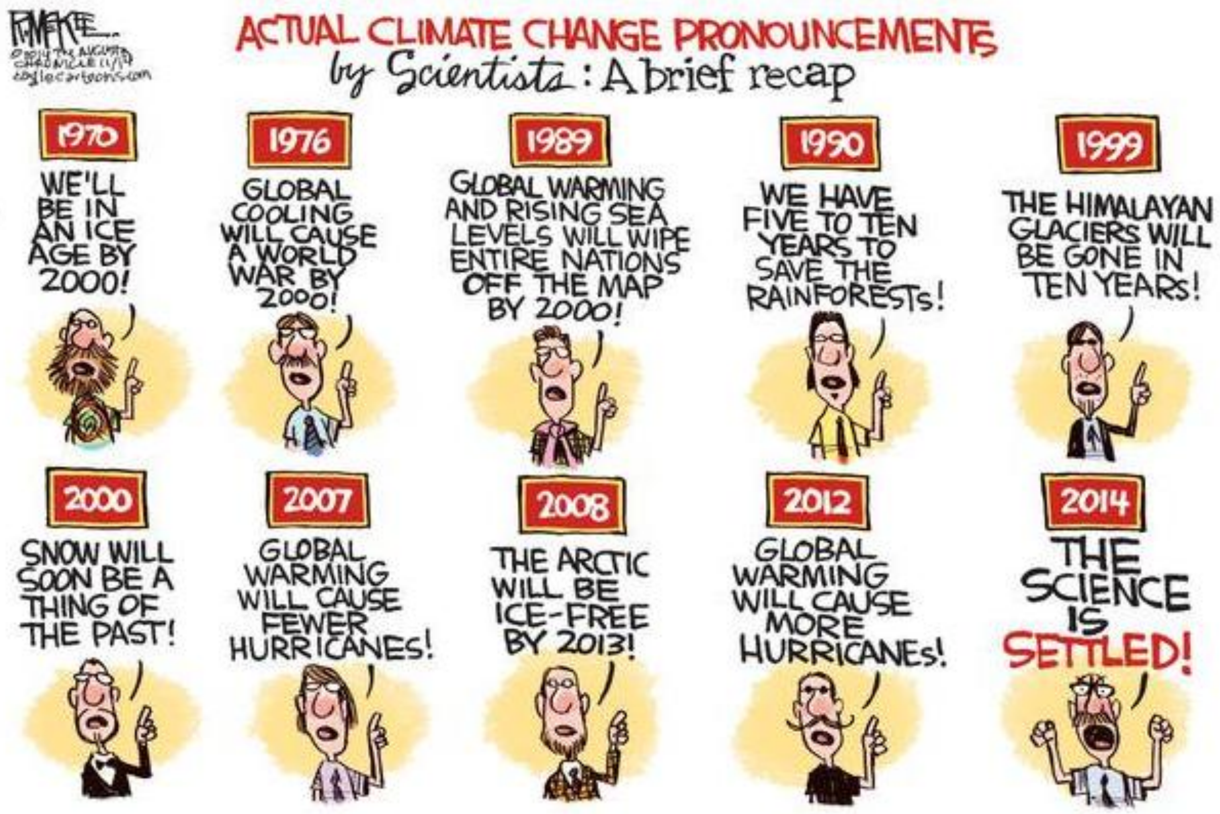
Moisture absorption by plant residue in soil

Turgut Kutlu, Andrey Guber, Michigan State University,

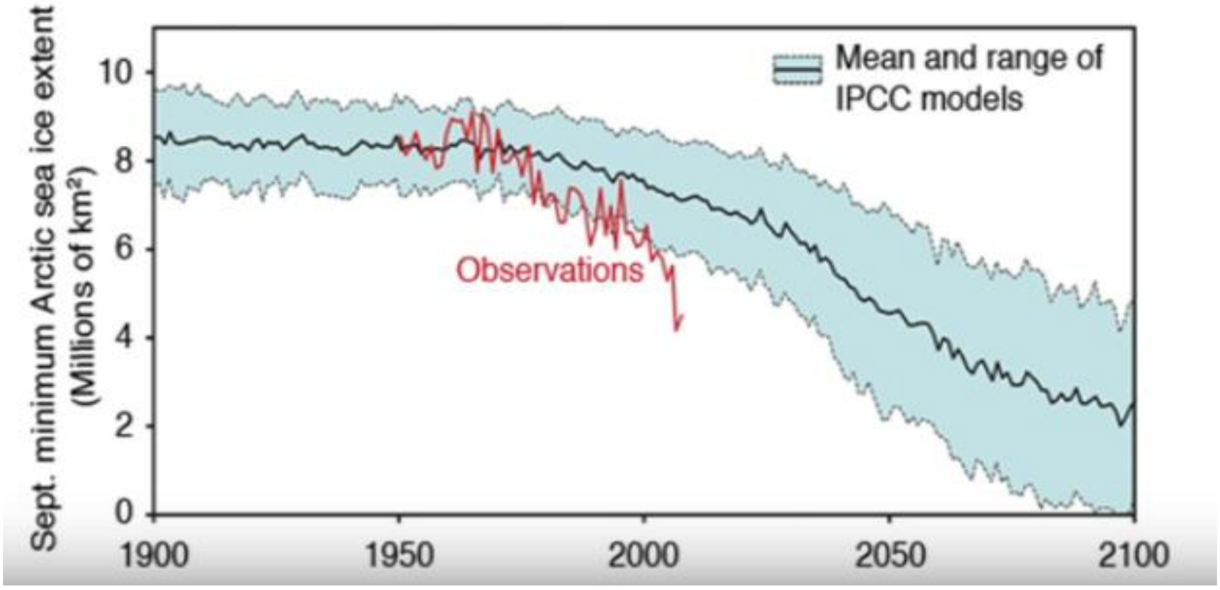
Mark L Rivers, University of Chicago, Alexandra Kravchenko, Michigan State University

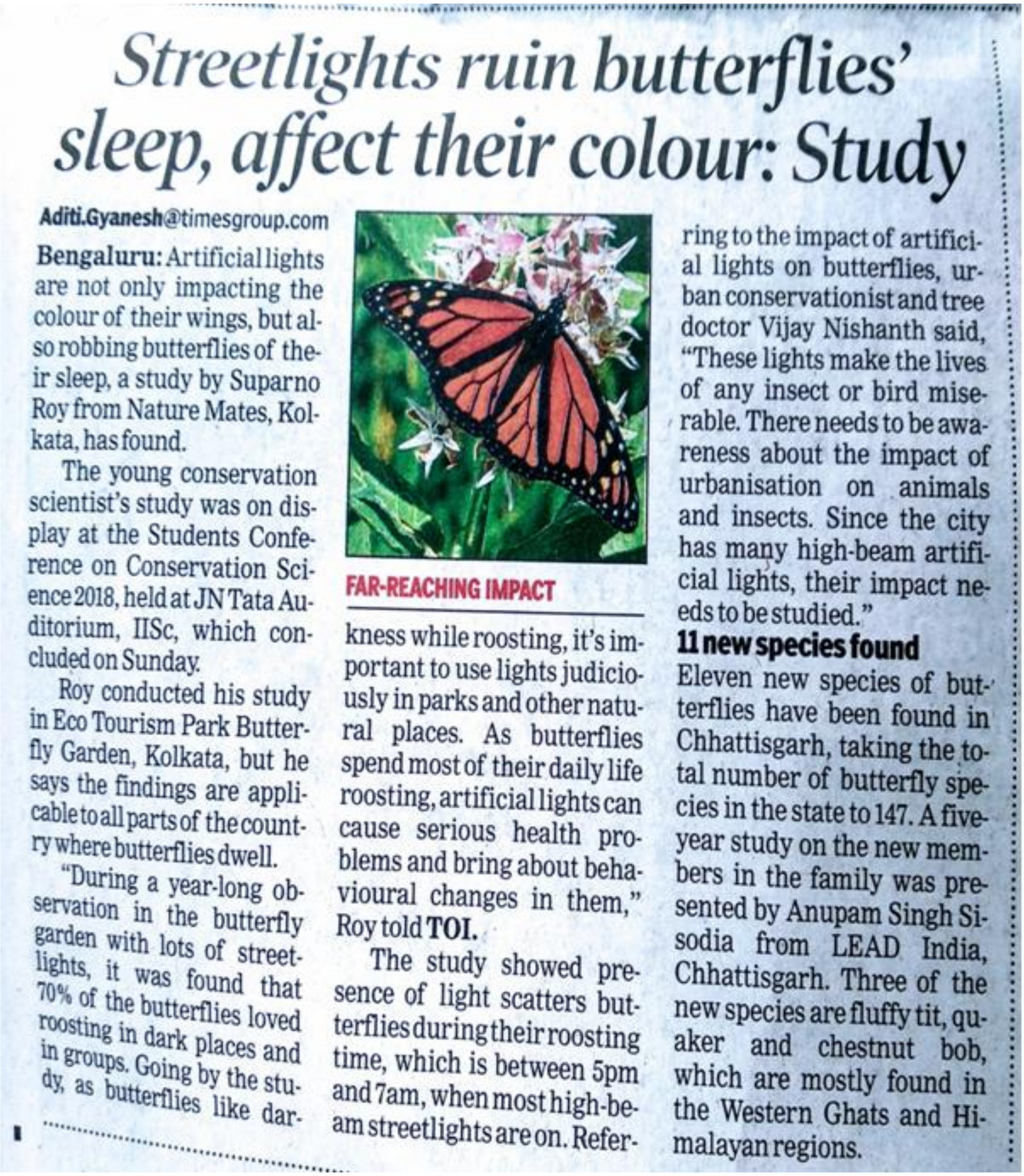
Oil incorporated plant residues are an important source of carbon inputs and its decomposition defines magnitudes of many soil processes. While soil properties, especially soil moisture levels, influence decomposition rates, the moisture level of plant residue itself can differ from that of the surrounding soil due to the so called **"sponge effect"-water absorption by plant residue** from the surrounding soil. Our study explored whether water absorption by plant residue varies depending on soil moisture and matric potential levels; and how soil characteristics and characteristics of the plant residue itself affect the magnitude of this effect. We examined water retention of two types of plant residue materials, namely, **corn** and **soybean leaves**, in soil materials with three contrasting particle size distributions (PSD); and analyzed water distribution patterns in the soil adjacent to the residue using X-ray computed micro-tomography. The results demonstrated that **the sponge effect was especially pronounced** when soil moisture levels ranged from 0.15 to 0.40 cm^3 cm− 3 (~ 30–80% water filled pore space). **The leaves were fully saturated with gravimetric water content levels** exceeding 2.0 g g− 1 even when the soil moisture level was only 0.15 cm^3 cm− 3. Subsequent **increase in residue moisture level** was achieved due to vertical swelling of residue and reached 3.0–4.0 g g− 1 at soil moisture levels > 0.30 cm^3 cm− 3. The **sponge effect was greater in the coarse textured soil materials** with lower soil water retention than in the fine textured soil material with high water retention; it was greater in soybean than in corn, possibly due to greater porosity of soybean leaves. Our results indicate that **plant residue fragments incorporated into soil likely create moisture microenvironments for microbial decomposers** that differ from those of the surrounding soil; and which, in relatively dry soil, can be more beneficial for plant decomposition than what can be inferred from the information on moisture levels of the soil itself.

Climate Risks We Face In The Near Future :


RAMIREZ
eaglecartoons.com
ACTUAL CLIMATE CHANGE PRONOUNCEMENTS
by Scientists : A brief recap
1970
WE'LL BE IN AN ICE AGE BY 2000!
1976
GLOBAL COOLING WILL CAUSE A WORLD WAR BY 2000!
1989
GLOBAL WARMING AND RISING SEA LEVELS WILL WIPE ENTIRE NATIONS OFF THE MAP BY 2000!
1990
WE HAVE FIVE TO TEN YEARS TO SAVE THE RAINFORESTS!
1999
THE HIMALAYAN GLACIERS WILL BE GONE IN TEN YEARS!
2000
SNOW WILL SOON BE A THING OF THE PAST!
2007
GLOBAL WARMING WILL CAUSE FEWER HURRICANES!
2008
THE ARCTIC WILL BE ICE-FREE BY 2013!
2012
GLOBAL WARMING WILL CAUSE MORE HURRICANES!
2014
THE SCIENCE IS SETTLED!

ON BEHALF OF LIFE
CLIMATE CHANGE:
12 YEARS TO SAVE EARTH





Streetlights ruin butterflies' sleep, affect their colour: Study

Aditi.Gyanesh@timesgroup.com

Bengaluru: Artificial lights are not only impacting the colour of their wings, but also robbing butterflies of their sleep, a study by Suparno Roy from Nature Mates, Kolkata, has found.

The young conservation scientist's study was on display at the Students Conference on Conservation Science 2018, held at JN Tata Auditorium, IISc, which concluded on Sunday.

Roy conducted his study in Eco Tourism Park Butterfly Garden, Kolkata, but he says the findings are applicable to all parts of the country where butterflies dwell.

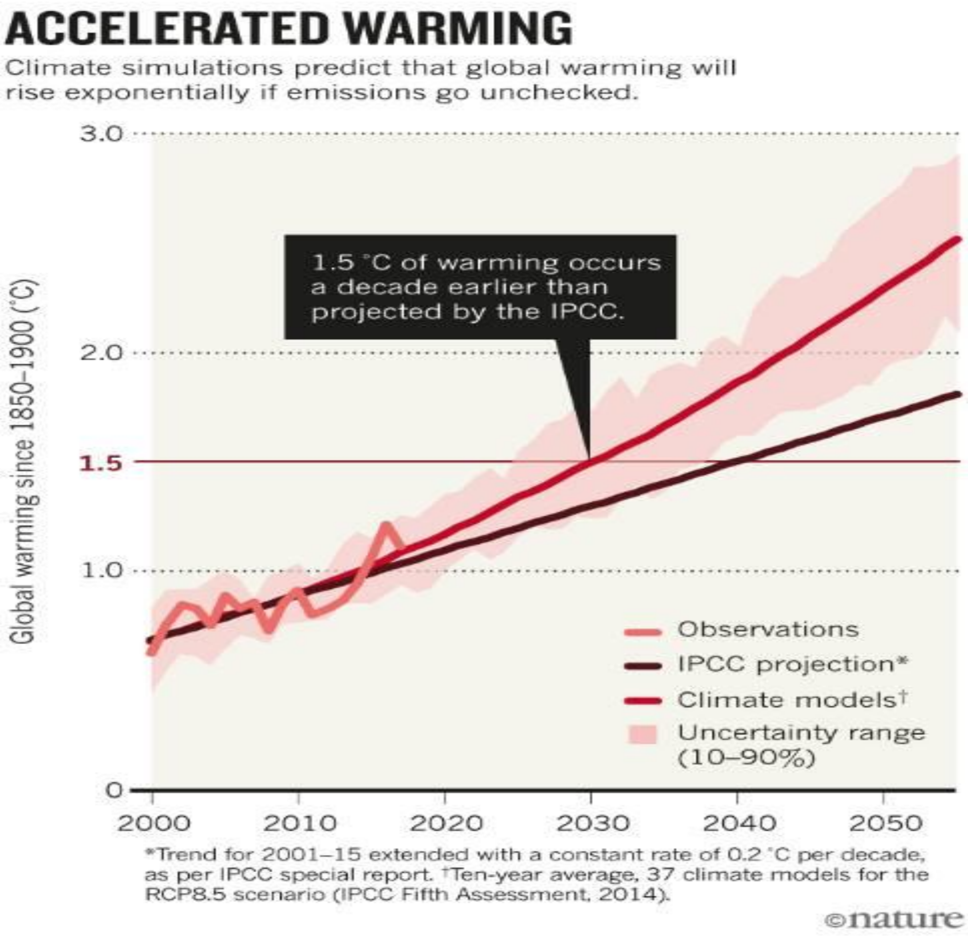
"During a year-long observation in the butterfly garden with lots of streetlights, it was found that 70% of the butterflies loved roosting in dark places and in groups. Going by the study, as butterflies like darkness while roosting, it's important to use lights judiciously in parks and other natural places. As butterflies spend most of their daily life roosting, artificial lights can cause serious health problems and bring about behavioural changes in them," Roy told **TOI.**

FAR-REACHING IMPACT

The study showed presence of light scatters butterflies during their roosting time, which is between 5pm and 7am, when most high-beam streetlights are on. Referring to the impact of artificial lights on butterflies, urban conservationist and tree doctor Vijay Nishanth said, "These lights make the lives of any insect or bird miserable. There needs to be awareness about the impact of urbanisation on animals and insects. Since the city has many high-beam artificial lights, their impact needs to be studied."

11 new species found

Eleven new species of butterflies have been found in Chhattisgarh, taking the total number of butterfly species in the state to 147. A five-year study on the new members in the family was presented by Anupam Singh Sisodia from LEAD India, Chhattisgarh. Three of the new species are fluffy tit, quaker and chestnut bob, which are mostly found in the Western Ghats and Himalayan regions.



Sources: Ref. 1/GISTEMP/IPCC Fifth Assessment Report (2014)

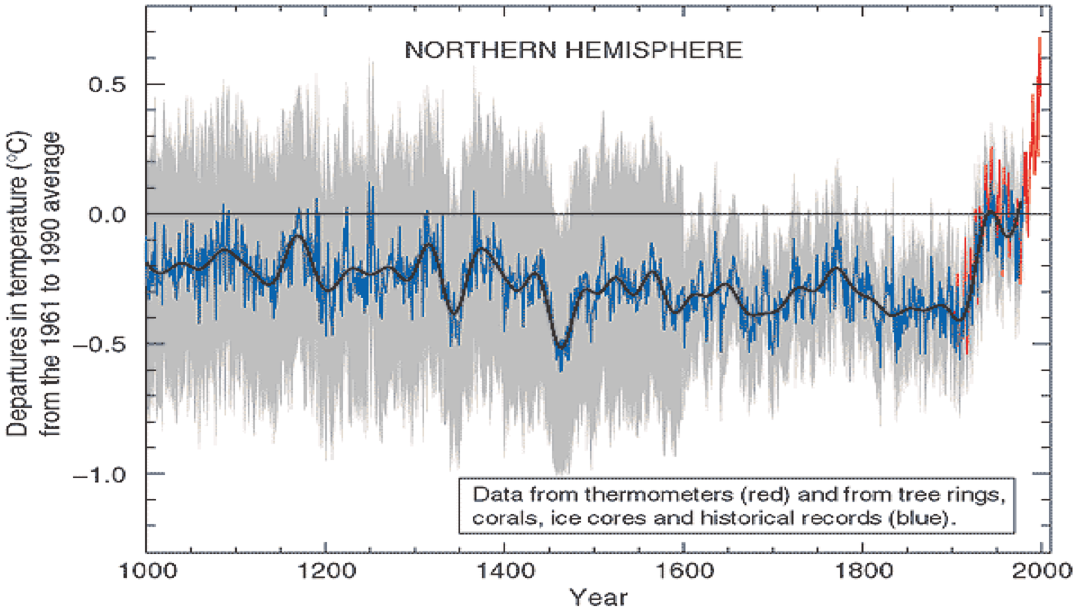
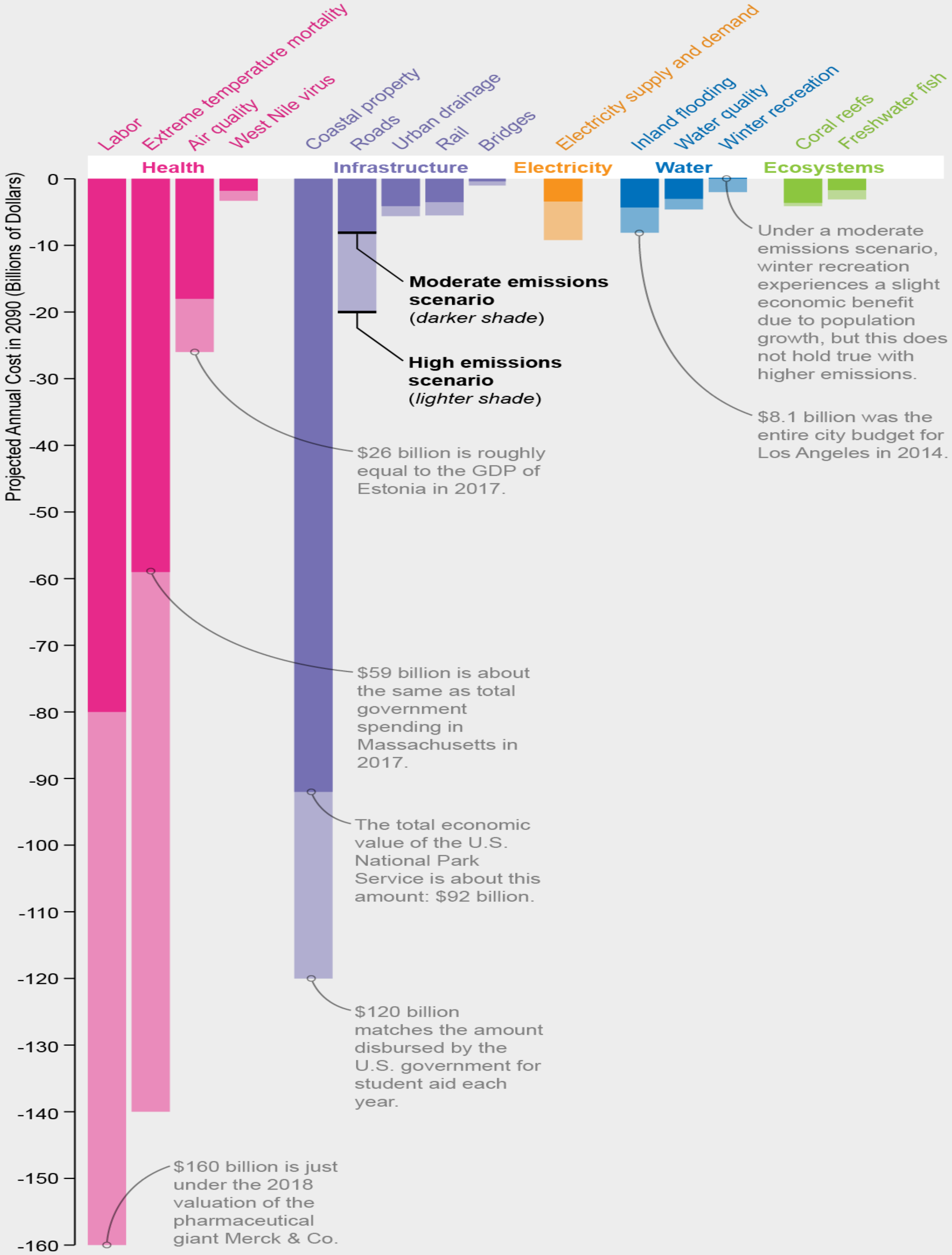


Fig. 4.5 The hockey stick – a glowing example of 'climate change denial'. The long, flat shaft of the graph is mostly reconstructed from tree-ring proxy data and the almost upright blade represents the instrumental temperature record, ending with the 1998 super El Niño. Other CAGW scientists have 'confirmed' the hockey stick by using much of the same dubious data and

The Costs of Climate Change

By the end of the 21st century, climate change will cause substantial losses across many sectors of the U.S. economy, according to the 2018 National Climate Assessment. Bringing greenhouse gas emissions down to more moderate levels and adapting to changing conditions can reduce the impacts and associated costs of warming. The following estimates of annual costs are based on 2015 U.S. dollars, and only the sectors with projected losses over $1 billion are shown.



Moderate emissions scenario (*darker shade*)

High emissions scenario (*lighter shade*)

$26 billion is roughly equal to the GDP of Estonia in 2017.

$59 billion is about the same as total government spending in Massachusetts in 2017.

The total economic value of the U.S. National Park Service is about this amount: $92 billion.

$120 billion matches the amount disbursed by the U.S. government for student aid each year.

$160 billion is just under the 2018 valuation of the pharmaceutical giant Merck & Co.

Under a moderate emissions scenario, winter recreation experiences a slight economic benefit due to population growth, but this does not hold true with higher emissions.

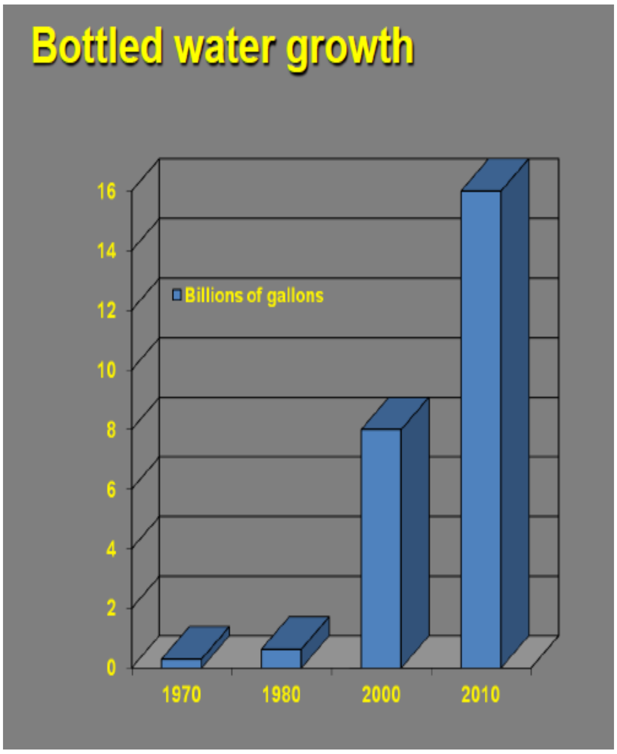
$8.1 billion was the entire city budget for Los Angeles in 2014.

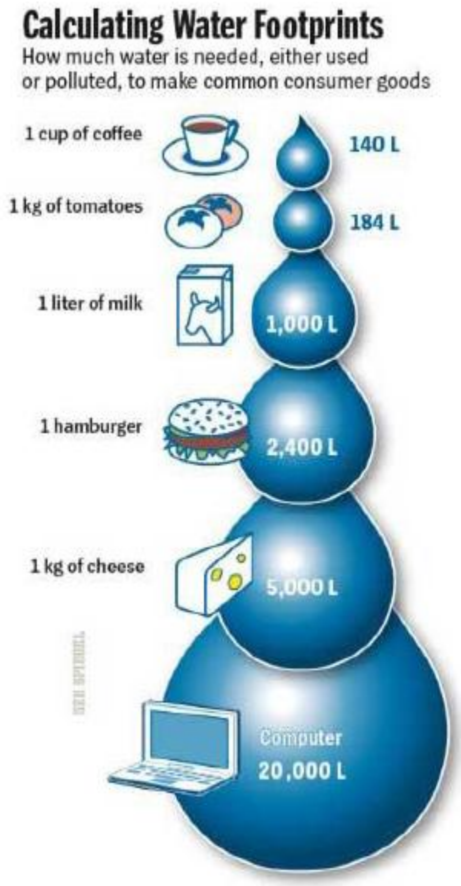
India's National Commission on Farmers reported that 40% of the agricultural populace would like to leave farming. So high is the level of their frustration and fatigue. Unless their problems are urgently addressed with vision and determination, this portends a potential *quarter billion* (250,000,000) villagers – *ecological and economic refugees* – streaming into urban slums in search of any available work to fill their bellies.

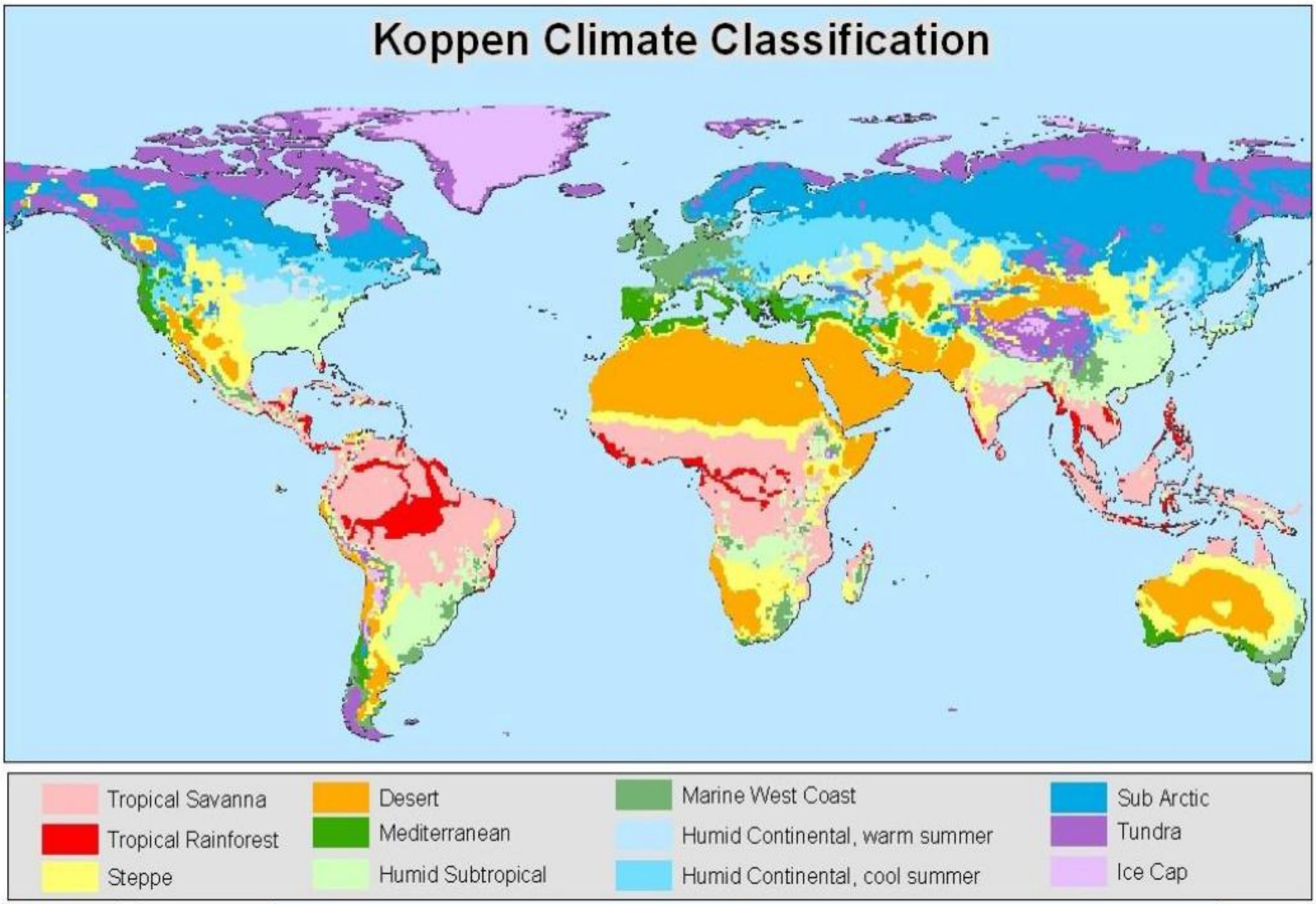
Has the government even remotely considered what it would take to provide 250 million sustainable livelihoods to absorb the threatening urban-swell? While some yet maintain that further urbanization, even if it is distress migration, is good for economic growth, the hard reality is that an average urban dweller consumes at least three times more resources than a country-based villager. With our limited per capita resources of land, water, energy and food, continued urbanization is definitely not viable – ecologically or economically.

"The sorry state of affairs in our *krishi pradhan* (predominantly agricultural) country is entirely man-made," points out Bhaskarbhai. "While Nature has been very generous with her gifts, we have taken them for granted, and misused them. Restoring the natural health of this land and her farming community is the *only* way to solve the inter-related problems of poverty, unemployment and rising population.

"The maximum number of people can become self-reliant through farming only if the necessary inputs are a bare minimum. Thus, farming should require a minimum of financial capital and purchased inputs, minimum farming equipment (plough, tools, etc.), minimum necessary labour, and minimum external technology. Then agricultural production will increase without costs increasing. Poverty will decline, and the rise in population will be spontaneously checked."


Bottled water growth
Billions of gallons
0
2
4
6
8
10
12
14
16
1970
1980
2000
2010


Calculating Water Footprints
How much water is needed, either used or polluted, to make common consumer goods
1 cup of coffee
140 L
1 kg of tomatoes
184 L
1 liter of milk
1,000 L
1 hamburger
2,400 L
1 kg of cheese
5,000 L
Computer
20,000 L

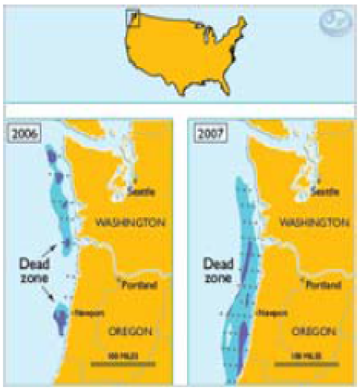

Koppen Climate Classification
Tropical Savanna
Tropical Rainforest
Steppe
Desert
Mediterranean
Humid Subtropical
Marine West Coast
Humid Continental, warm summer
Humid Continental, cool summer
Sub Arctic
Tundra
Ice Cap

The more prolonged and intense the downwelling-favorable winds and resulting upwelling are, the more severe the hypoxia becomes. Hence, the highly hypoxic year of 2006 was dominated by particularly strong upwelling-favorable northerly winds, particularly infrequent downwelling-favorable southerly winds and particularly large accumulations of phytoplankton. By contrast, the summer of 2009 was marked by periods of southerly downwelling-favorable winds that helped dissipate low oxygen conditions. "Therefore, the hypoxia of 2009 was neither as extreme nor as long-lasting as that of 2006.

UNDERLYING CAUSES

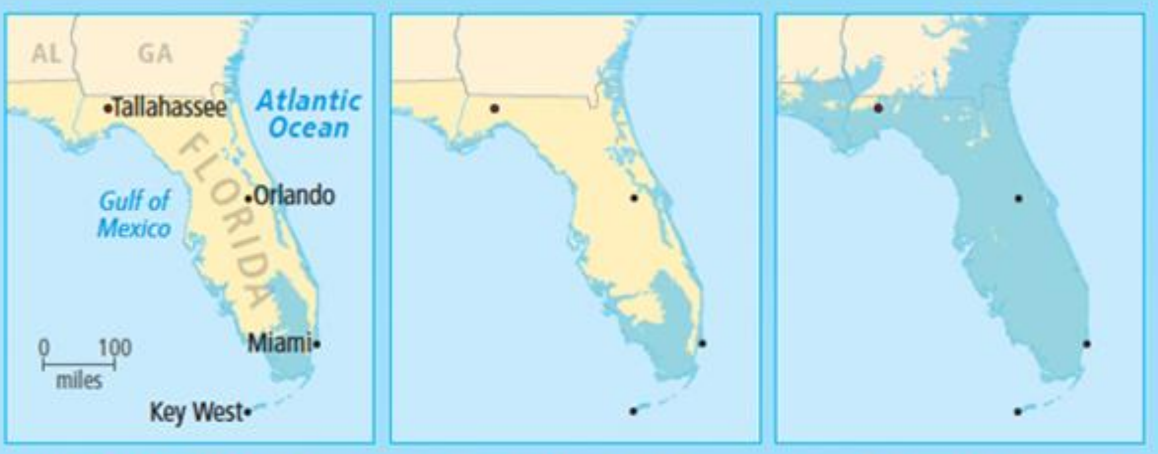
What is the underlying cause of the decreases in the oxygen content of subsurface offshore waters and changes in coastal winds? One theory points to large-scale cyclic changes in oceanic circulation and atmospheric conditions that have hit the Pacific Northwest every 10 to 20 years. But Barth says evidence that these phenomena are unrelated to one another includes the lack of agreement in the timing of the development of coastal dead zones and the timing of these cyclic changes, which are evidenced in available records covering the last 50 years.

Rather, Barth favors an alternative theory; he suspects that climate change is driving down the oxygen content of subsurface offshore waters and altering coastal winds. This theory is supported by agreement between the predicted effects of climate change and the very types of changes in oceanic and atmospheric conditions and decreases in the oxygen content of deep water that are currently observed in the Pacific Northwest. (Climate change may reduce the oxygen content of deep water by warming surface waters, and thereby insulating deeper waters from contact with the atmosphere, where oxygen originates.)



Extent of Dead Zones
Blue shows where low-oxygen conditions developed (<1.4 ml/l) and purple shows where extremely low-oxygen conditions developed (<0.5 ml/l) in 2006 and 2007. Shoreline waters remain high in oxygen because breaking waves

Caldeira says.



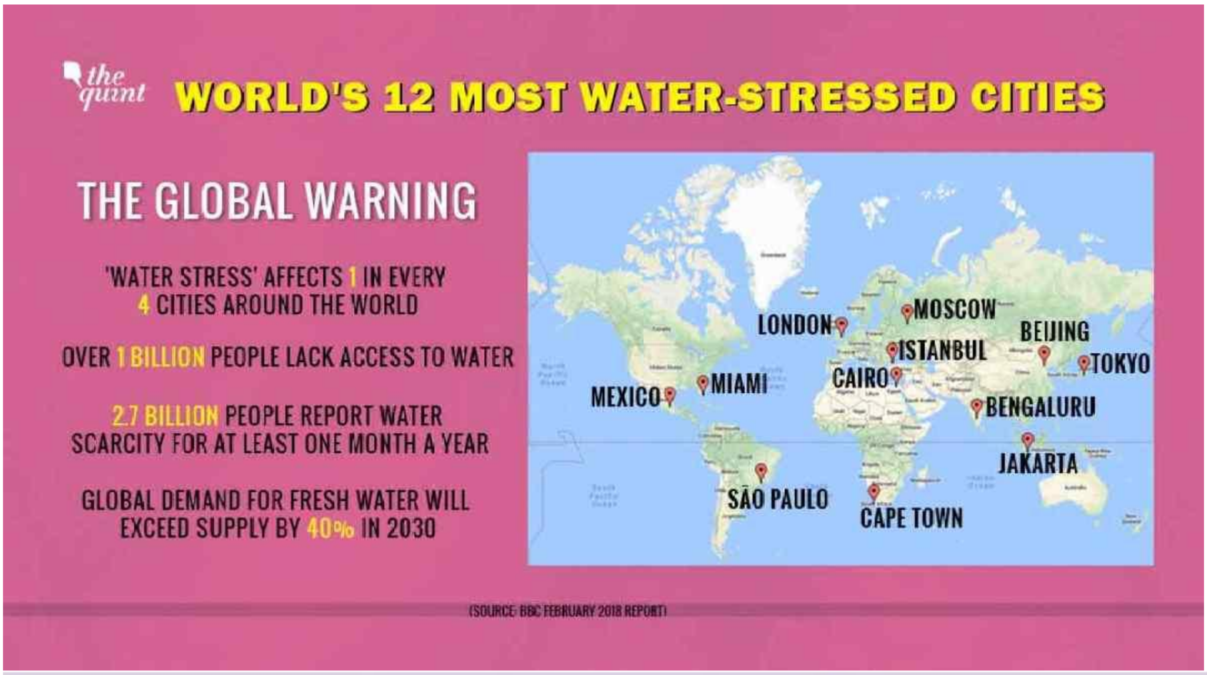
▲ West Antarctic ice sheet holds enough ice to raise sea level globally by 19 feet. Coastal and south Florida would be flooded.

▲ Greenland ice sheet is the equivalent of 24 feet of global sea level. Flooding in Florida would be similar to the West Antarctic case.

▲ East Antarctic ice sheet could raise sea level globally by 170 feet. Virtually the entire state of Florida would be underwater.

By Mapping Specialists. Originally produced for "The Unquiet Ice," By Robin E. Bell, in *Scientific American*, February 2008.

The simulations have practical implications for billions of coastal residents as well. If the seas



the quint
LONDON
MOSCOW
BEIJING
ISTANBUL
TOKYO
CAIRO
MIAMI
MEXICO
BENGALURU
JAKARTA
SÃO PAULO
CAPE TOWN

WORLD'S 12 MOST WATER-STRESSED CITIES

THE GLOBAL WARNING

'WATER STRESS' AFFECTS 1 IN EVERY 4 CITIES AROUND THE WORLD

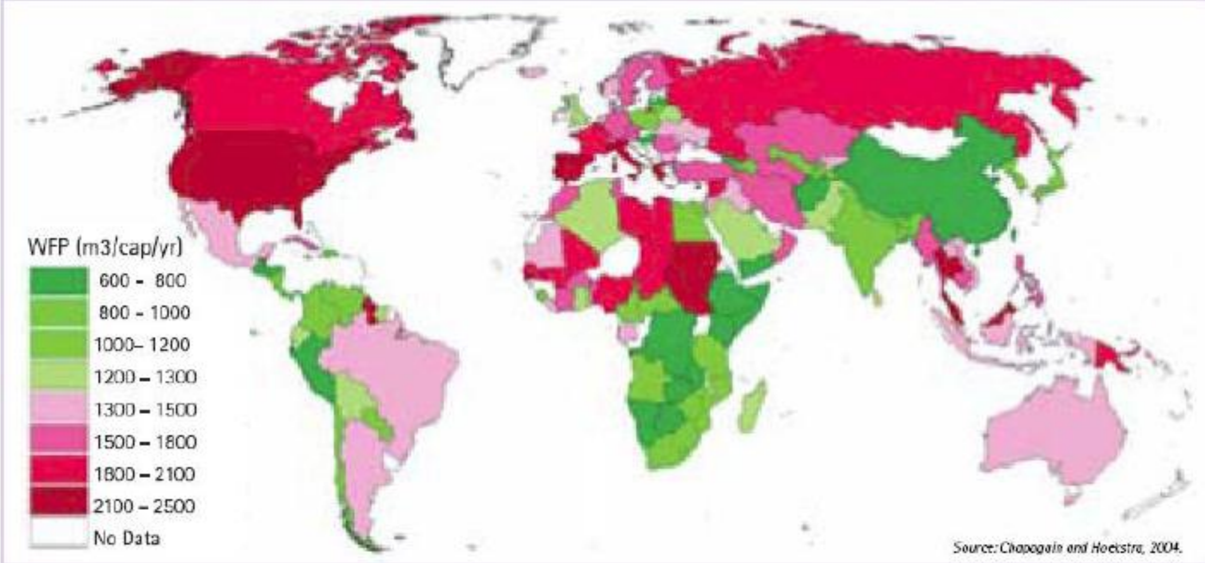
OVER 1 BILLION PEOPLE LACK ACCESS TO WATER

2.7 BILLION PEOPLE REPORT WATER SCARCITY FOR AT LEAST ONE MONTH A YEAR

GLOBAL DEMAND FOR FRESH WATER WILL EXCEED SUPPLY BY 40% IN 2030

(SOURCE: BBC FEBRUARY 2018 REPORT)

National water footprints around the world, 2004



WFP (m3/cap/yr)
600 - 800
800 - 1000
1000– 1200
1200 – 1300
1300 – 1500
1500 – 1800
1800 – 2100
2100 – 2500
No Data

Source: Chapagain and Hoekstra, 2004.

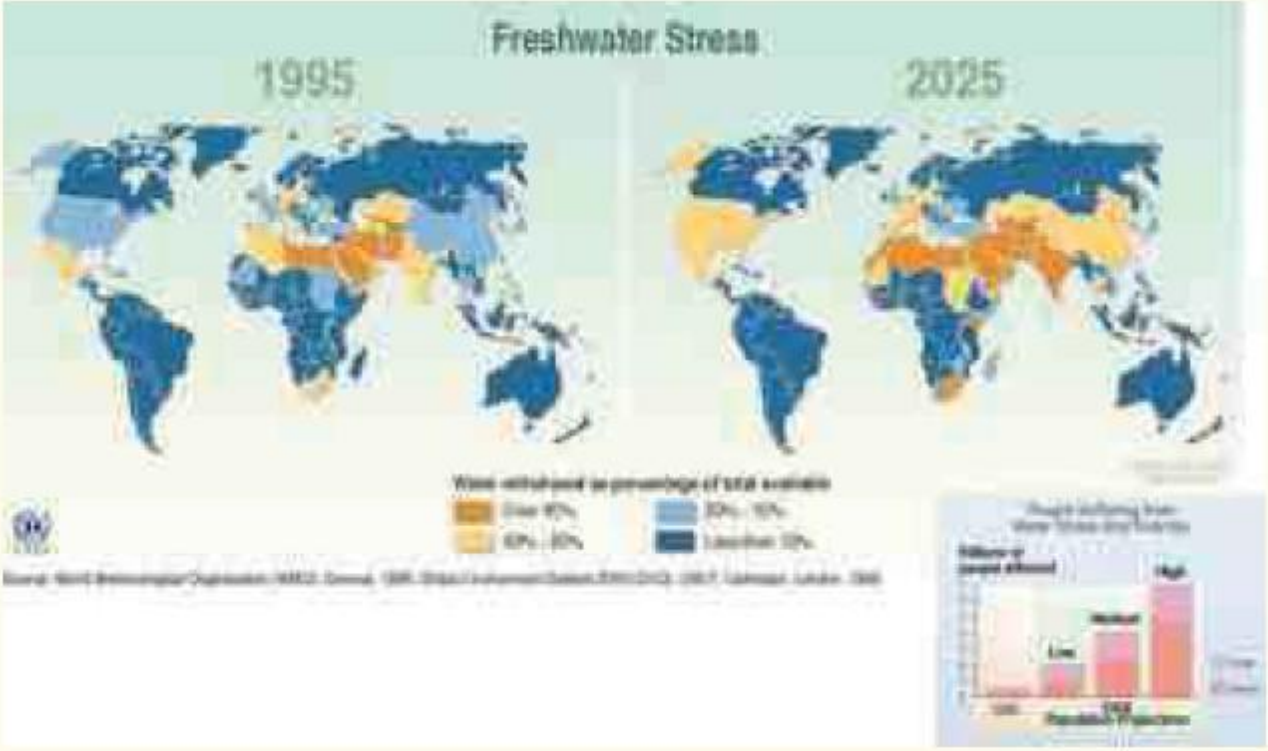
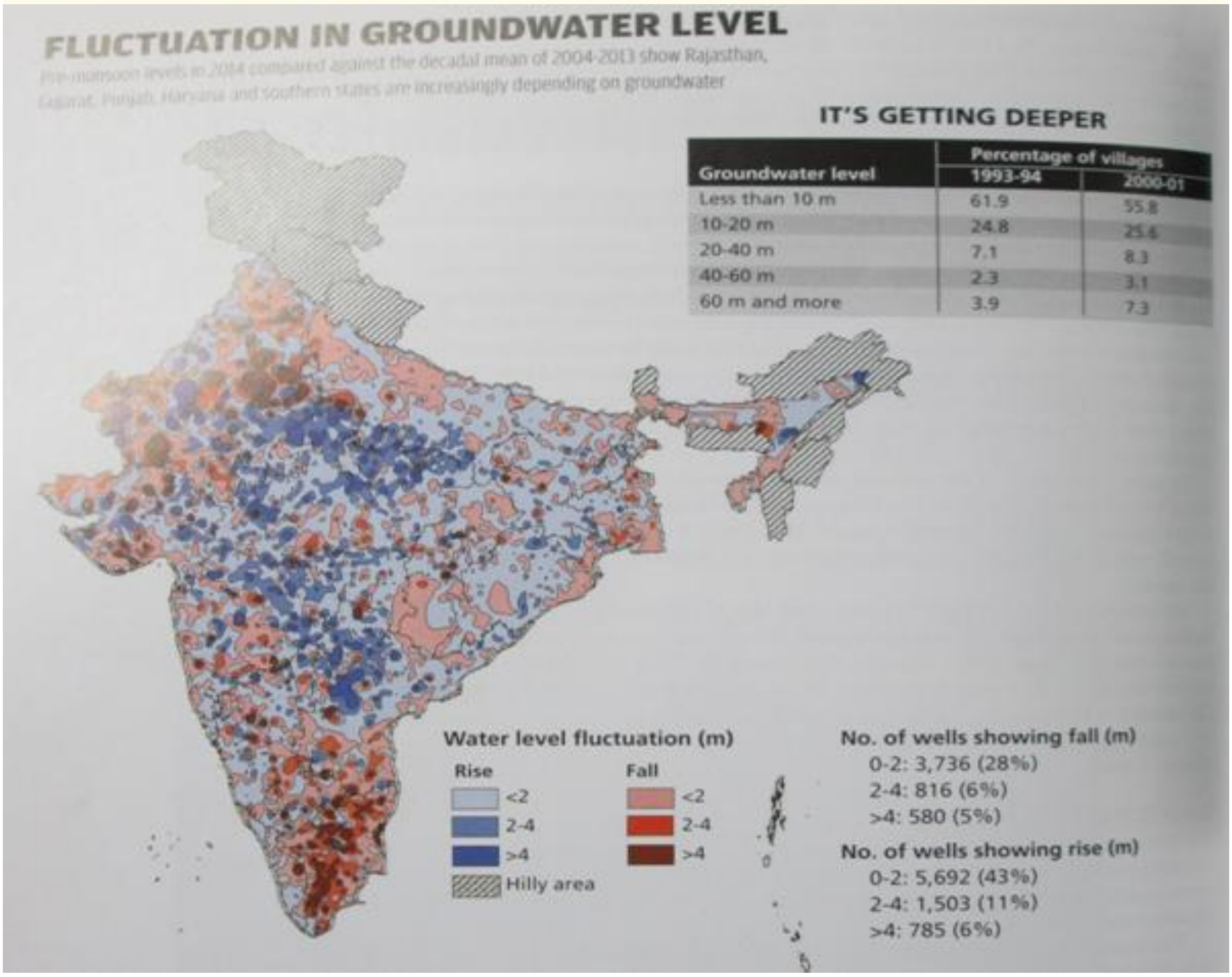

Freshwater Stress
1995
2025

Figure 1: Fresh water sources changing over the years



FLUCTUATION IN GROUNDWATER LEVEL

Pre-monsoon levels in 2014 compared against the decadal mean of 2004-2013 show Rajasthan, Gujarat, Punjab, Haryana and southern states are increasingly depending on groundwater

IT'S GETTING DEEPER

Groundwater level	Percentage of villages	
	1993-94	2000-01
Less than 10 m	61.9	55.8
10-20 m	24.8	25.6
20-40 m	7.1	8.3
40-60 m	2.3	3.1
60 m and more	3.9	7.3

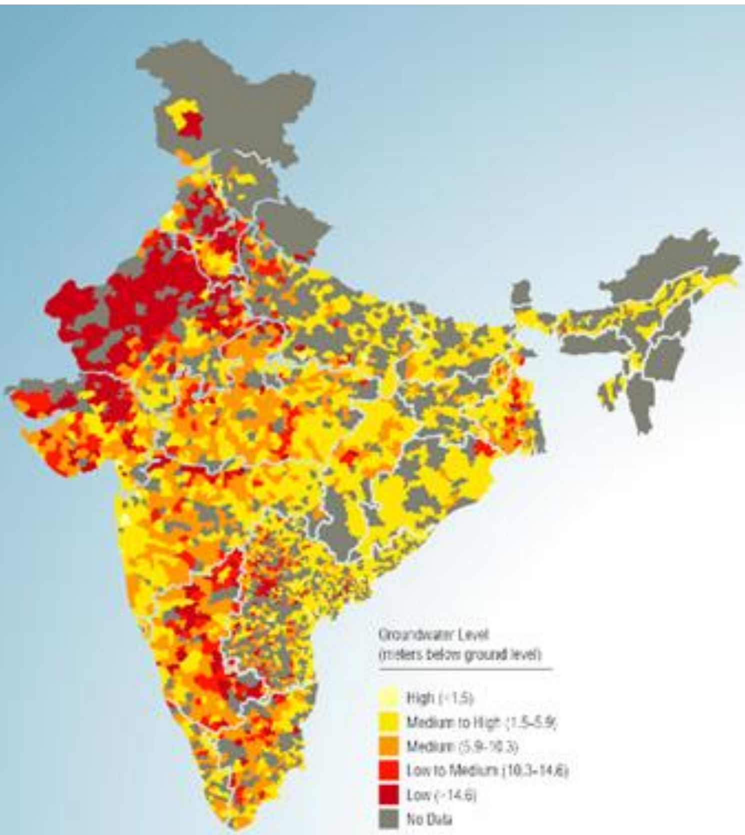
Water level fluctuation (m)
Rise
<2
2-4
>4
Fall
<2
2-4
>4
Hilly area

No. of wells showing fall (m)
0-2: 3,736 (28%)
2-4: 816 (6%)
>4: 580 (5%)

No. of wells showing rise (m)
0-2: 5,692 (43%)
2-4: 1,503 (11%)
>4: 785 (6%)

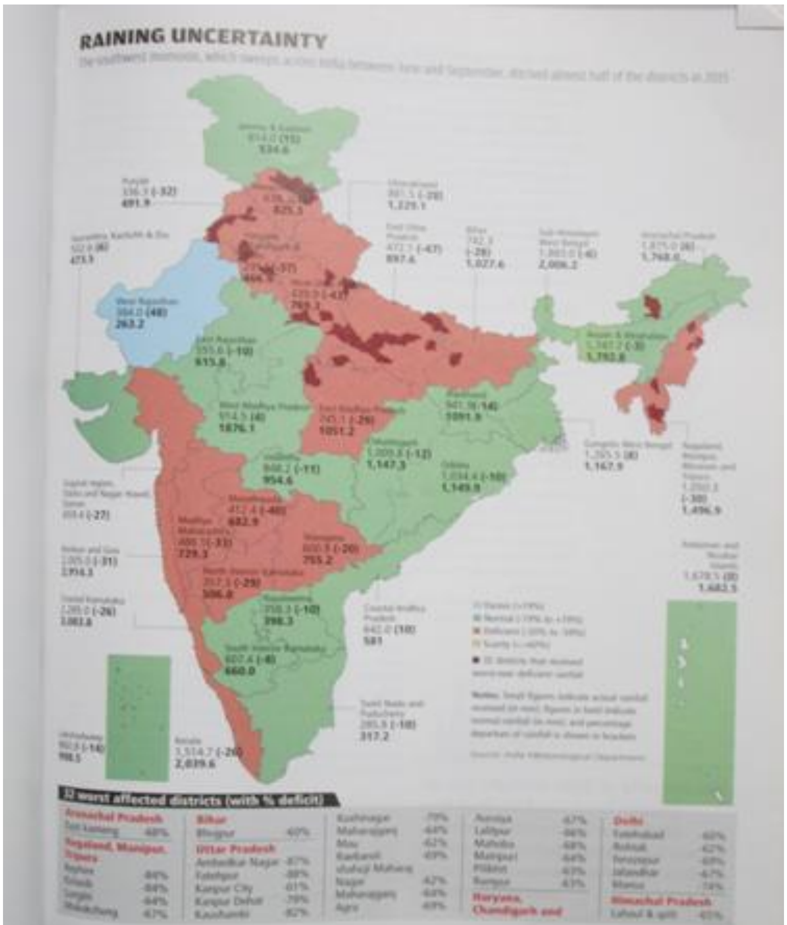
54%

# of India’s Ground- Water Wells Are Decreasing

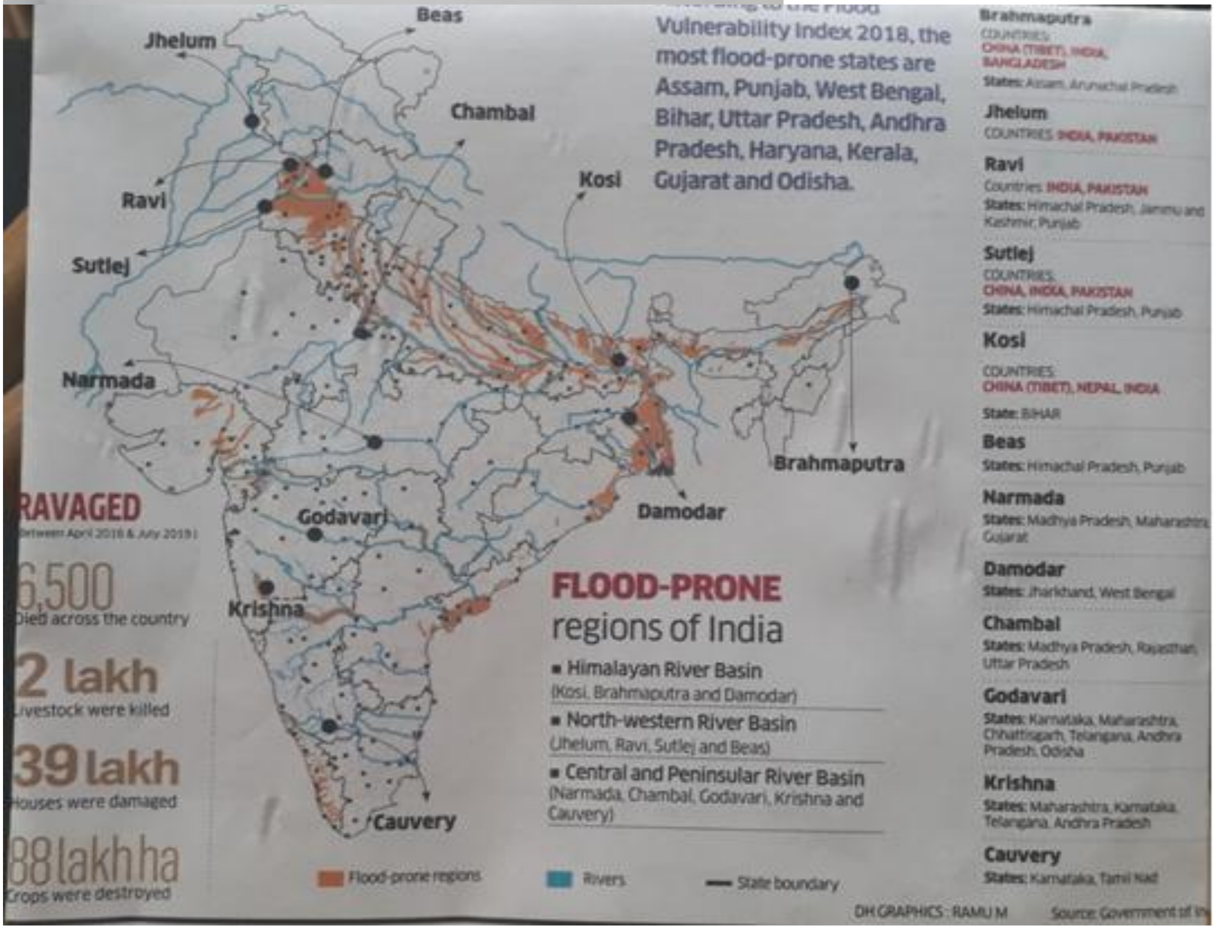

Groundwater Level
(meters below ground level)
High (<1.5)
Medium to High (1.5-5.9)
Medium (5.9-10.3)
Low to Medium (10.3-14.6)
Low (>14.6)
No Data

Thirsty...

Water is now the No. 1 problem in urban India as seen in Aurangabad in Maharashtra. Three crore people, or every third person in the state, today depend on tankers for their daily supply.



RAINING UNCERTAINTY



Vulnerability Index 2018, the most flood-prone states are Assam, Punjab, West Bengal, Bihar, Uttar Pradesh, Andhra Pradesh, Haryana, Kerala, Gujarat and Odisha.

RAVAGED
(Between April 2018 & July 2019)

6,500
Died across the country

2 lakh
ivestock were killed

39 lakh
ouses were damaged

88 lakh ha
rops were destroyed

FLOOD-PRONE regions of India

- Himalayan River Basin
(Kosi, Brahmaputra and Damodar)
- North-western River Basin
(Jhelum, Ravi, Sutlej and Beas)
- Central and Peninsular River Basin
(Narmada, Chambal, Godavari, Krishna and Cauvery)

Brahmaputra
COUNTRIES: CHINA (TIBET), INDIA, BANGLADESH
States: Assam, Arunachal Pradesh

Jhelum
COUNTRIES: INDIA, PAKISTAN

Ravi
Countries: INDIA, PAKISTAN
States: Himachal Pradesh, Jammu and Kashmir, Punjab

Sutlej
COUNTRIES: CHINA, INDIA, PAKISTAN
States: Himachal Pradesh, Punjab

Kosi
COUNTRIES: CHINA (TIBET), NEPAL, INDIA
State: BIHAR

Beas
States: Himachal Pradesh, Punjab

Narmada
States: Madhya Pradesh, Maharashtra, Gujarat

Damodar
States: Jharkhand, West Bengal

Chambal
States: Madhya Pradesh, Rajasthan, Uttar Pradesh

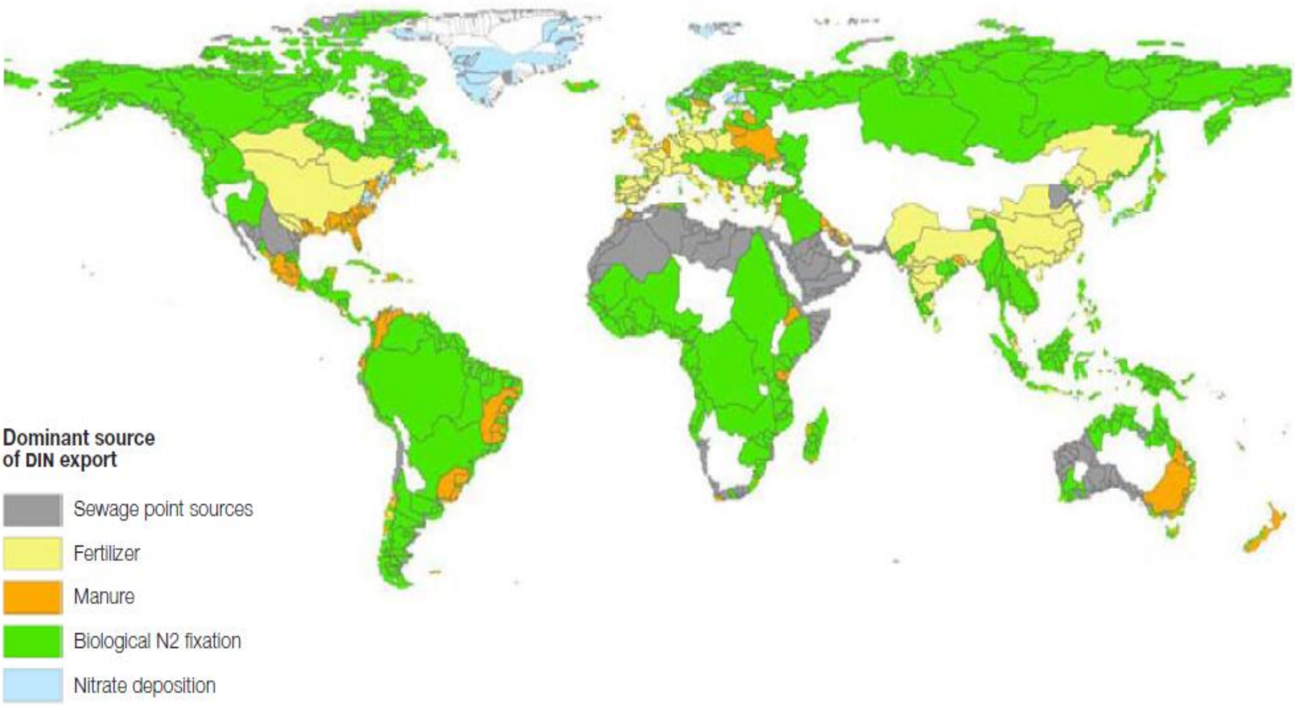
Godavari
States: Karnataka, Maharashtra, Chhattisgarh, Telangana, Andhra Pradesh, Odisha

Krishna
States: Maharashtra, Karnataka, Telangana, Andhra Pradesh

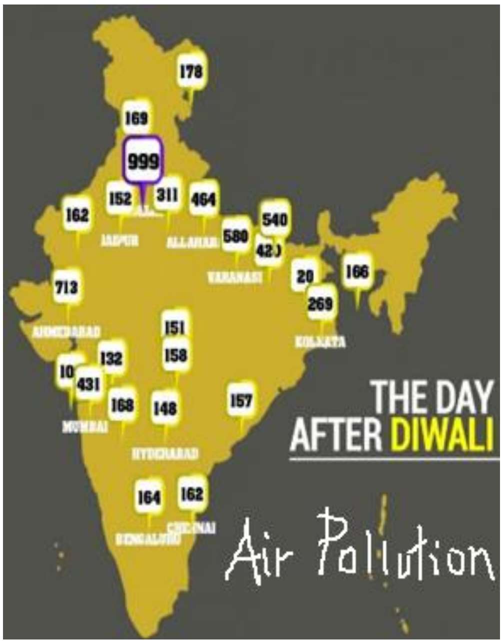
Cauvery
States: Karnataka, Tamil Nad

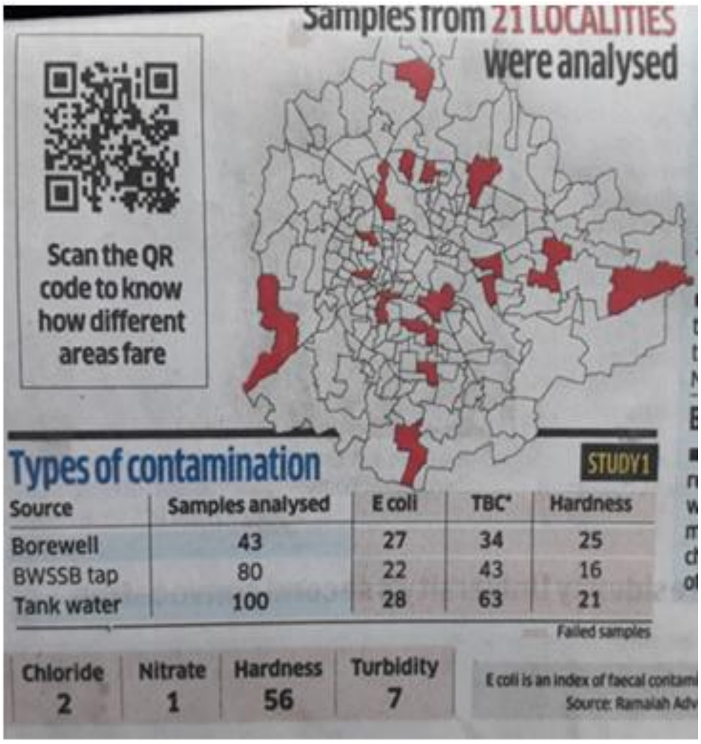
DH GRAPHICS : RAMU M Source: Government of In

FIGURE 2 Dominant sources of dissolved inorganic nitrogen (DIN) export in different river basins across the world


Dominant source of DIN export
Sewage point sources
Fertilizer
Manure
Biological N2 fixation
Nitrate deposition

SOURCE: DUMONT ET AL. 2005


178
169
999
152
311
464
162
JAIPUR
ALLAHAB
580
540
42
VARANASI
20
166
269
713
AHMEDABAD
KOLKATA
151
158
132
10
431
168
148
157
MUMBAI
HYDERABAD
164
162
BENGALURU
CHENNAI
THE DAY AFTER DIWALI
Air Pollution



Samples from 21 LOCALITIES were analysed

Scan the QR code to know how different areas fare

Types of contamination STUDY1

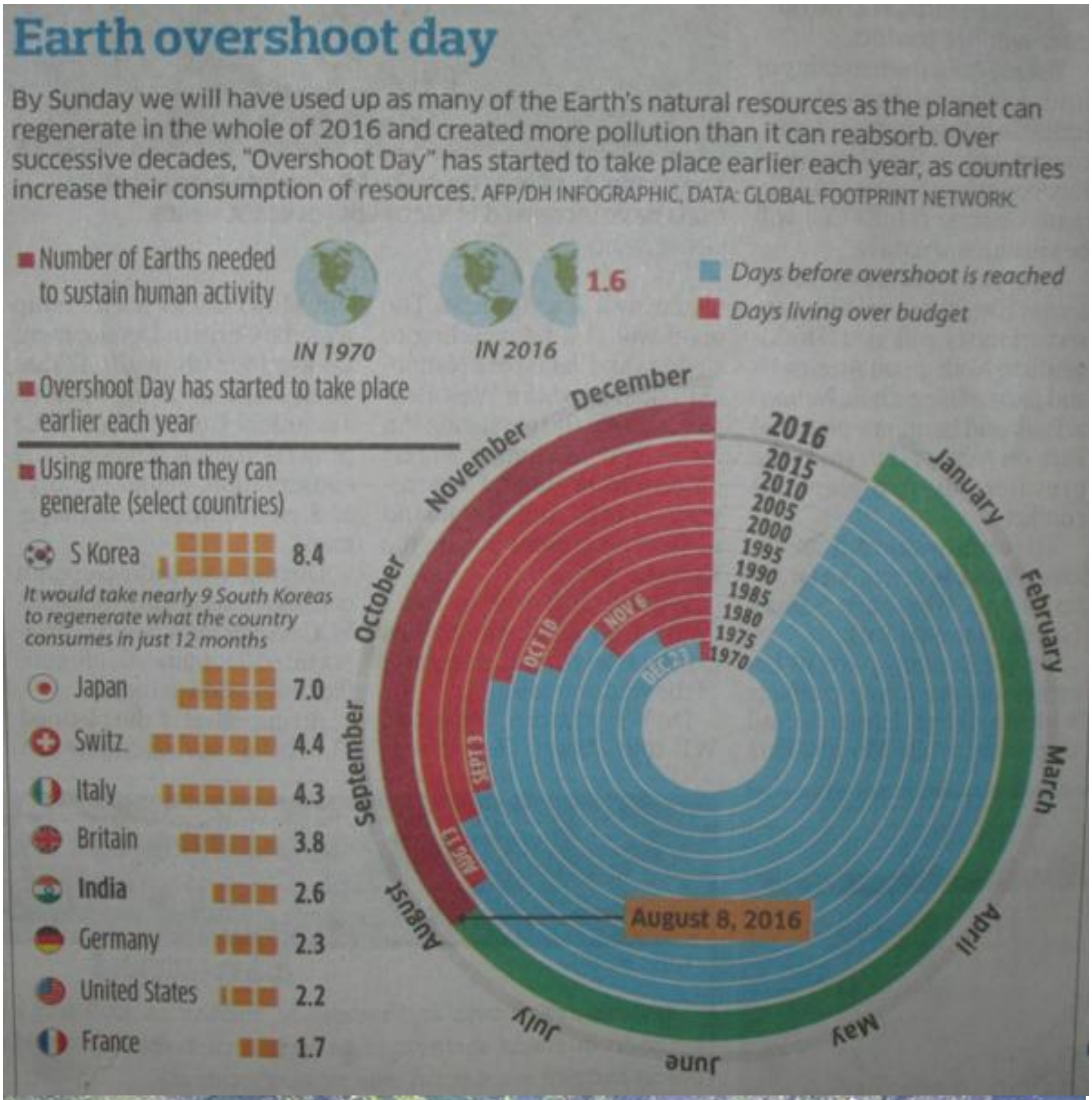
Source	Samples analysed	E coli	TBC*	Hardness
Borewell	43	27	34	25
BWSSB tap	80	22	43	16
Tank water	100	28	63	21

Failed samples

Chloride	Nitrate	Hardness	Turbidity
2	1	56	7

E coli is an index of faecal contami

Source: Ramaiah Adv



Earth overshoot day

By Sunday we will have used up as many of the Earth's natural resources as the planet can regenerate in the whole of 2016 and created more pollution than it can reabsorb. Over successive decades, "Overshoot Day" has started to take place earlier each year, as countries increase their consumption of resources. AFP/DH INFOGRAPHIC, DATA: GLOBAL FOOTPRINT NETWORK

■ Number of Earths needed to sustain human activity

IN 1970

IN 2016 1.6

■ Overshoot Day has started to take place earlier each year

■ Using more than they can generate (select countries)

S Korea	8.4
Japan	7.0
Switz.	4.4
Italy	4.3
Britain	3.8
India	2.6
Germany	2.3
United States	2.2
France	1.7

It would take nearly 9 South Koreas to regenerate what the country consumes in just 12 months

Days before overshoot is reached

Days living over budget

2016
2015
2010
2005
2000
1995
1990
1985
1980
1975
1970
DEC 23
NOV 6
OCT 18
SEPT 3
AUG 13
August 8, 2016
January
February
March
April
May
June
July
August
September
October
November
December

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